FEBRUARY 15, 1959
Price 50c

TELEPHONE ENGINEER & MANAGEMENT
the telephone industry magazine

TELEPHONE ENGINEER & MANAGEMENT 50th ANNIVERSARY 1909 1959 THE TELEPHONE INDUSTRY MAGAZINE

PUBLIC LIBRARY FEB 19 1959 DETROIT

"Formula For Halting Progress"

"It seems to us that now is the time for concentrated industry action aimed specifically at the elimination of what we term the *'Formula For Halting Progress'* — low rates which result in poorer service at higher cost than would be attained if the company were allowed to achieve good but fair earnings. The formula has been around too long . . . . "

Part One of This Thought-Provoking EDITORIAL . . . . Page 33

ELECTRONICS NOTEBOOK
"Capacitor Circuits"
Page 46

PLANT MAN'S "SPEC" BOOK
"Materials and Tools"
Page 66

SUB-HARMONICS & OVERTONES
"The Right Voltmeter"
Page 48

COMMERCIAL NOTES
"Selling the Non-User"
Page 51

ACCOUNTING NOTES
"Usable Ratios"
Page 58

"THE INDUSTRY'S FUTURE"
By Bill Corman
Page 43

take our CUSTOMERS' WORD for it-

Customer satisfaction is one reason why L. M. Berry and Company has successfully enjoyed the association of leading Telephone Companies throughout the United States for 49 years.

Since 1932, L. M. Berry and Company has been handling the Directory Advertising for the Knightstown Telephone Company, one of Berry's many satisfied customers.

You, too, can enjoy the numerous advantages and added profit derived from having L. M. Berry and Company handle your Directory Advertising. Call or write today.

KNIGHTSTOWN TELEPHONE COMPANY
Incorporated
Knightstown Indiana

October 17, 1958

L. M. Berry and Company
Hulman Building
Dayton 2, Ohio

Gentlemen:

In consulting the files recently, it was brought to my attention that your fine organization has been handling the publication of our Knightstown telephone directory for a period of twenty-six years. I found the original agreement was entered into December 5, 1932, and has been continued in force since that date.

We feel this record speaks for itself. It certainly is indicative of our complete satisfaction with your efficient service and the harmonious working relationship existing between our respective organizations. While the substantial net profit realized from the sale of directory advertising is extremely important to a telephone company of our size, we consider other factors to be of equal importance.

The vast amount of progress made in the telephone industry is not limited to technical advances alone, but must include good customer relations throughout. It is our opinion that providing subscribers with an accurate, attractive and modern directory plays a big part in accomplishing this. The courteous, business-like contacts made by your field representatives are reflected in the ever-increasing advertising sales volume. The careful attention devoted by your office personnel is evidenced by the almost total lack of directory errors encountered.

It is a pleasure to acknowledge a job well done and we look forward to a long continuation of this pleasant association.

Very truly yours,

Clark Mull

E. C. Mull
Manager

Since 1910

L. M. BERRY
AND COMPANY

Hulman Building • Dayton 2, Ohio • BAldwin 4-7421

TELEPHONE DIRECTORY ADVERTISING EXCLUSIVELY

why ORANGE COUNTY TELEPHONE CO.
...along with thousands of Independents all over America...prefers
SHERRON STEEL BOOTHS

Frank D. Fancher, vice president and general manager of Orange County Telephone Co., knows a revenue-producing spot when he sees it. Here's the kind of location that promotes "impulse" calls . . . influencing car riders and pedestrians alike to stop, look and obey that impulse. (Recent studies show that more than half of all paystation calls are impulse calls.) The Orange County Telephone Co. has many outdoor booths (and indoor booths too) in and around Middletown, N. Y. The Sherron steel booth shown here, compelling and accessible, is at the five-point intersection of New York highways 17M and 84, and is visible from any direction. Mr. Fancher, a seasoned and knowledgeable executive, knows there are no finer booths, none more economical in the long run than brightly colored Sherron steel booths . . . engineered to endure with the least maintenance.

There's a Sherron booth for every location and budget in either zinc coated, cold rolled or stainless steel.

SEE OUR CATALOG IN SWEET'S — INDEPENDENT — Sherron ACOUSTIC SEE-THRU STEEL-STAINLESS STEEL OUTDOOR AND INDOOR TELEPHONE BOOTHS

SHERRON METALLIC CORP., 1201 FLUSHING AVE., BROOKLYN 37, N.Y.

IN CANADA: W. S. GERRIE & ASSOCIATES, LTD., 66 RACINE ROAD, REXDALE (TORONTO)

Profit-saver because it's easy to install

Like all 1A1-type multi-line systems, the Stromberg-Carlson 6K-1 PBX produces increased revenue. But the 6K-1 system is *more profitable to you.*

The 6K-1, with our "1575" instrument, installs quick and easy with no outside engineering help. This means fast amortization of your capital investment in equipment and installation . . . higher profits sooner.

In addition to boosting your profit, this compact system offers more *customer-preferred* features: smallest desk instrument; dial selective intercom for up to 15 stations; automatic tie-lines to other 6K-1 systems; manual exclusion; power-failure circuit; manual intercom; audible trunk signal.

Increase your profits. Specify the 6K-1 system. *Your customers will like the small, compact telephone.* A Stromberg-Carlson representative will gladly supply full technical data and selling aids.

STROMBERG-CARLSON A DIVISION OF GENERAL DYNAMICS CORPORATION

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NEW! EXTRA LONG RECEIVER Koiled Kords*

NOW IN COLOR

Extra long receiver KOILED KORDS in color enable you to offer another service to those subscribers who want to move more than four and a half feet from their instruments.

New, long KOILED KORDS retractile cords in color — and in black — are offered in two standard lengths, 18 inches retracted that extend to approximately 9 feet and 30 inches retracted that extend to 15 feet.

Extra long receiver KOILED KORDS are available in colors to match all telephones. See your telephone supply house for full information.

Koiled Kords

INCORPORATED

BOX K, NEW HAVEN 14, CONNECTICUT

KOILED KORDS, the original retractile cords, are the result of 17 years of research, development and use.

* KOILED KORDS is a trade mark of KOILED KORDS, INC.

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TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

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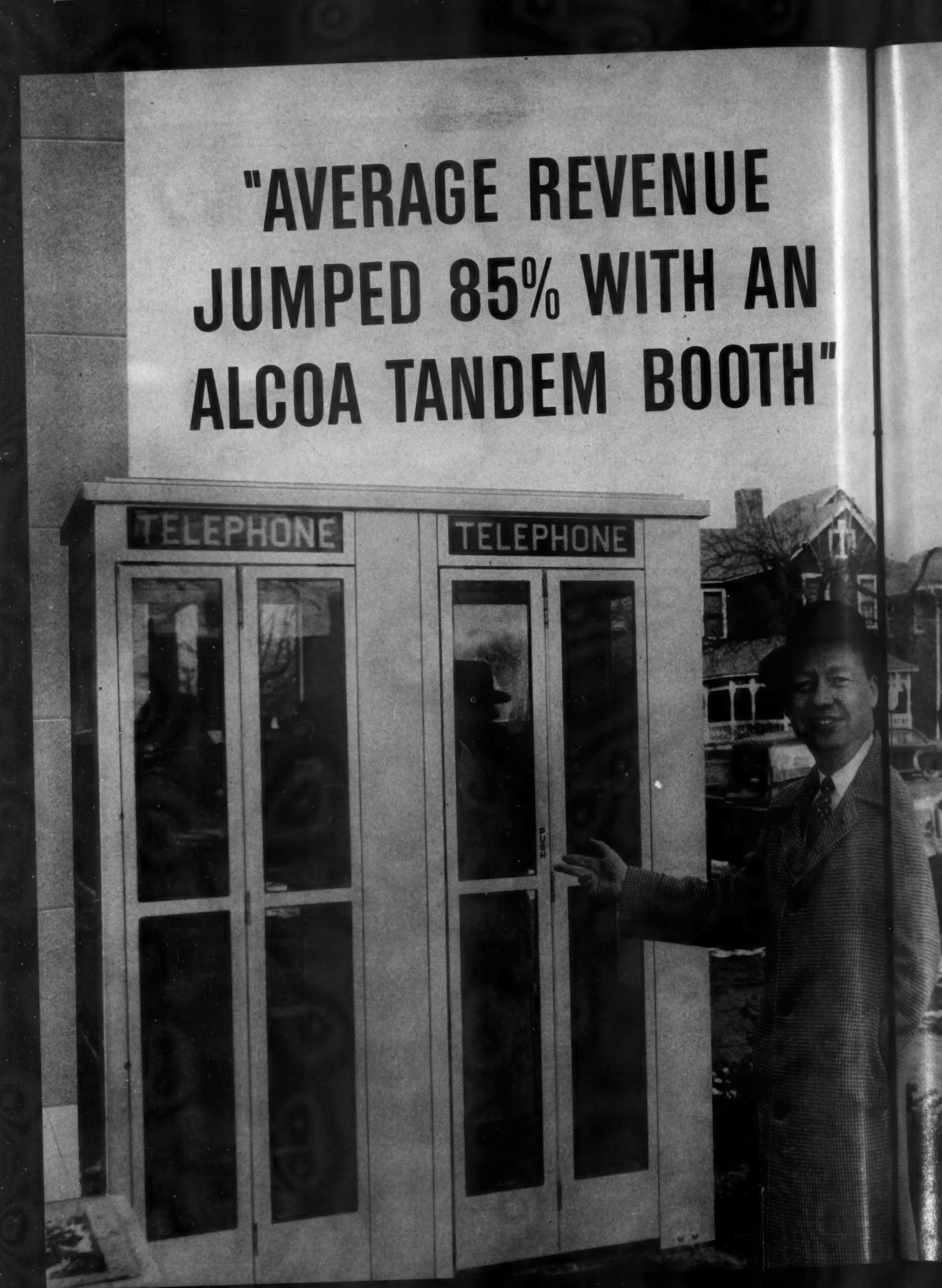

"AVERAGE REVENUE
JUMPED 85% WITH AN
ALCOA TANDEM BOOTH"
TELEPHONE
TELEPHONE
PUSH

reports F. J. Eherenman of United Telephone Company of Indiana

"Early last year, we replaced an ordinary single booth with a new Alcoa tandem assembly and noticed an immediate increase in revenue," says F. J. Eherenman, General Commercial Supervisor of United Telephone Company of Indiana, Warsaw, Ind.

"We had noticed customers standing in line to use the single booth in front of our business office in Franklin and considered placing another booth along side it. But we decided to install an Alcoa® Aluminum tandem assembly for three big reasons: (1) aluminum's clean, good looks and solid construction blend well with our new, modern exchange building which just opened in January, (2) cost of painting every three or four years is eliminated, and (3) the tandem booth requires less space than two single booths, takes a minimum of sidewalk area.

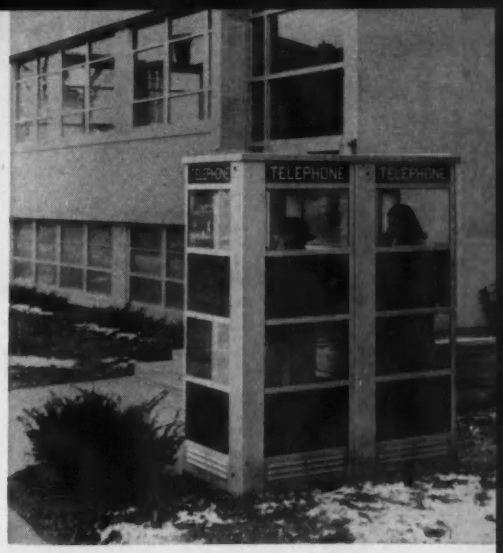
"In the first seven months of service the Alcoa tandem assembly has more than paid its way. Revenue has soared from the previous installation to an average increase of over 85 per cent. It's quite obvious that our customers also like Alcoa booths."

ALCOA GOODWILL KITS

Here's a big extra you get with every Alcoa booth. These FREE kits contain newspaper mats, publicity releases, envelope stuffers, radio and TV commercials—everything you need to tell customers about the added convenience of booths of Alcoa Aluminum.

For more information on Alcoa booths, write for brochure. And ask your jobber how Alcoa booths can increase your revenue and build customer goodwill. Aluminum Company of America, 1721-B Alcoa Building, Pittsburgh 19, Pennsylvania.

◊ F. J. Eherenman, General Commercial Supervisor of United Telephone Company of Indiana, points to the two features of the Alcoa tandem assembly he likes best: the clean, bright appearance that attracts customers and the sleek, compact construction that blends well with the modern architecture of the new Franklin exchange building.



"Notice how neatly the Alcoa tandem booth fits into a minimum of space in front of our new building," says Mr. Eherenman. "Notice, too, how its clean, modern lines make it almost a part of the building because it blends so well with it."

"We erected our Alcoa tandem booth without difficulty," says Supervisor Eherenman. "Easy-to-follow assembly instructions came right with it, and two of our men had the whole job done in a few hours. The Alcoa tandem booth is more compact and has no hard-to-clean gap between the booths. It's strong, too, and both weather- and vandal-resistant."

Old Installation Single Booth	Revenue	New Installation Alcoa Tandem Assembly	Revenue
November, 1957	$ 92.75	March, 1958	$112.60
December, 1957	89.90	April, 1958	125.10
January, 1958	88.10	May, 1958	181.60
February, 1958	103.55	June, 1958	183.00
		July, 1958	174.25
		August, 1958	253.90
		September, 1958	199.30
		October, 1958	155.35

"It's easy to see how monthly revenue jumped immediately after the installation of the modern Alcoa tandem booth," reports Mr. Eherenman.

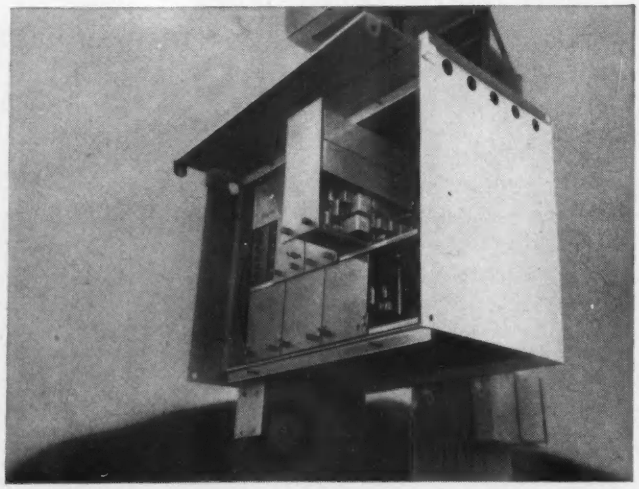
ALCOA ALUMINUM
ALUMINUM COMPANY OF AMERICA

Your Guide to the Best in Aluminum Value

For Exciting Drama Watch **"Alcoa Theatre,"** Alternate Mondays, **NBC-TV,** and **"Alcoa Presents,"** Every Tuesday, **ABC-TV**

New Kellogg K-31 Carrier System

Ideal for Rural Subscribers



Kellogg's new K-31 rural subscriber carrier system provides telephone companies with toll quality subscriber carrier at low cost. The system is completely transistorized, features printed circuits, miniaturized sub-assemblies and plug-in construction.

Standby power, consisting of two small batteries and a transistorized charger in a pole-mounted housing, is available. This is possible because power consumption is less than three watts even during talking.

K-31 has built-in compandors to assure quiet talking circuits and is automatically regulated to eliminate the effect of changing weather conditions over a wide range of carrier line losses.

Line-up and test procedure is very simple—a single level control for each direction of transmission. Terminating telephone type jacks are provided for ease and speed in testing. Installation time is held to a minimum by the use of a unique pole-mounted housing with built-in protected terminal blocks for external connections.

These design features plus top quality components and workmanship make K-31 reliable and stable in its operation.

Ask your Kellogg sales representative for full details.

KELLOGG Communications Division of IT&T
CHICAGO, ILLINOIS

Kellogg Switchboard and Supply Company, 6650 South Cicero Avenue, Chicago 38, Illinois. Communications Division of International Telephone and Telegraph Corporation.

Regional Offices and Warehouses: See two-page Kellogg advertisement pages 34-35 for complete listing.

coming

CONVENTIONS

TEXAS Telephone Association, Hilton Hotel, San Antonio, March 2-4, 1959.

KENTUCKY Telephone Association, Phoenix Hotel, Lexington, March 3, 1959.

IOWA Telephone Association, Hotel Fort Des Moines, Des Moines, April 7-8, 1959.

OHIO Telephone Association, Deshler Hilton Hotel, Columbus, April 13-15, 1959.

ILLINOIS Telephone Association, Hotel Pere Marquette, Peoria, April 20-21, 1959.

NEBRASKA Telephone Association, Hotel Cornhusker, Lincoln, Apr. 21-22, 1959.

INDIANA Telephone Association, Claypool Hotel, Indianapolis, Ind., May 6-7, 1959.

WISCONSIN Telephone Association, Plankington House, Milwaukee, May 13-14, 1959.

KANSAS - MISSOURI Telephone Associations, Continental Hotel, Kansas City, Mo., May 25-26, 1959.

PENNSYLVANIA Telephone Association, Buck Hill Falls Inn, Buck Hill Falls, June 1-3, 1959.

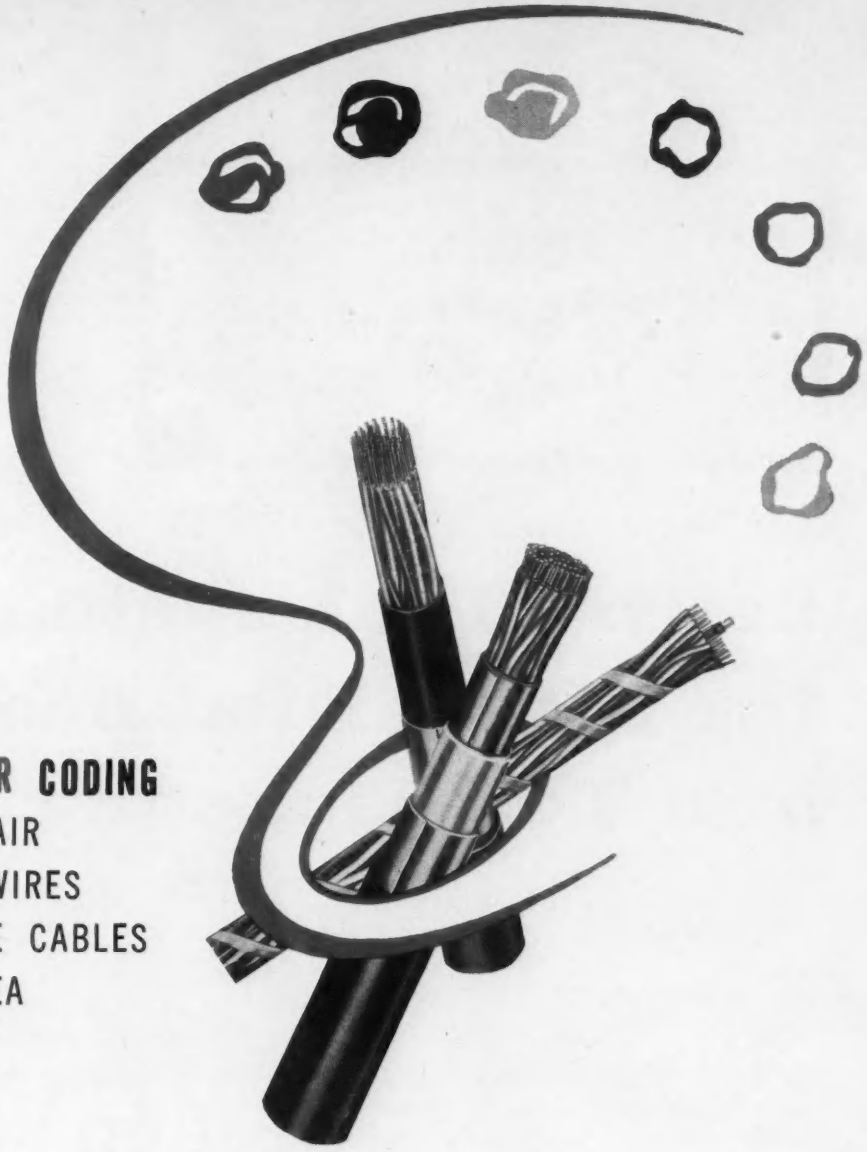
CALIFORNIA Telephone Association, Ambassador Hotel, Los Angeles, June 3-5, 1959.

WASHINGTON-OREGON Telephone Associations, Olympic Hotel, Seattle, Washington, June 11-12-13, 1959.

NEW YORK Telephone Association, Scaroon Manor, Schroon Lake, June 15-17, 1959.

TENNESSEE Telephone Association, Hermitage Hotel, Nashville, Tennessee, Sept. 9-10, 1959.

ARKANSAS Telephone Association, Arlington Hotel, Hot Springs, Ark., Sept. 14-15, 1959.



New
Universal COLOR CODING
for all MULTIPAIR
DISTRIBUTION WIRES
AND TELEPHONE CABLES
as listed by REA

For complete information on new color codings, write for Bulletin R1058.

THE REX CORPORATION **100 Hayward Road, West Acton, Mass.**

From the
Equipment Engineer's
Point of View-

Leich's Dial System Is Ready for Direct Distance Dialing and Toll Ticketing Needs

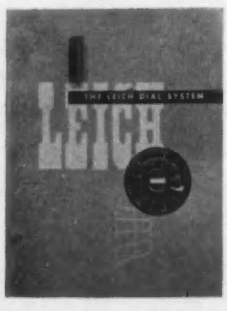
An equipment engineer's job is to plan for the future needs of your telephone company. That's why he can recommend the Leich Dial System with confidence. The Leich Dial System is ready now to handle your present or future direct distance dialing and toll ticketing needs.

You can meet such requirements economically—without the expense of completely overhauling your equipment—by using Leich manual or semi-automatic line identification equipment. It properly identifies the calling line from the Leich Dial System in cases where the distant office has toll ticketing equipment.

Leich Intercept Facilities are also available.

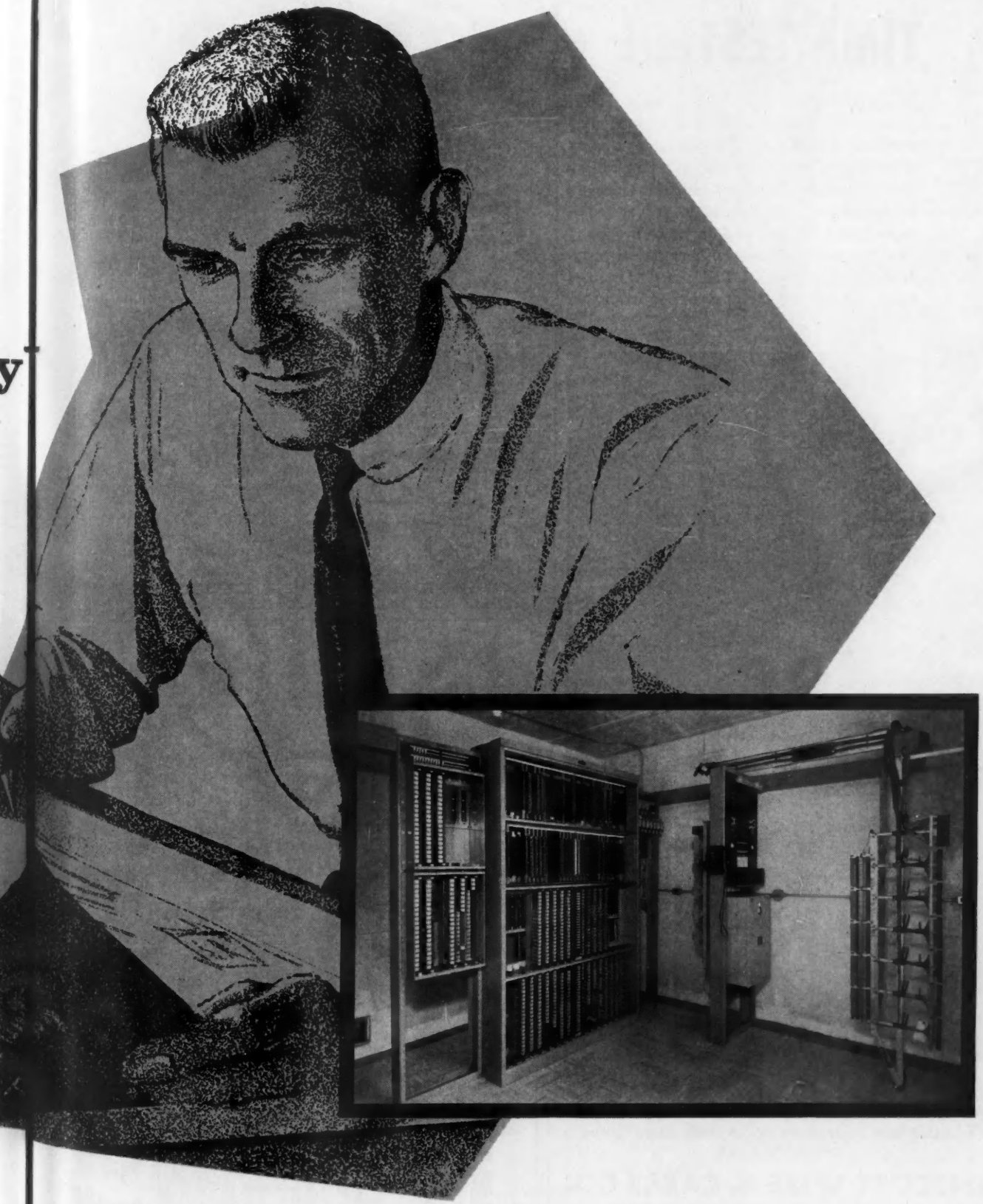
By adding Leich Intercept Facilities to Leich dial switchboards now in service, you meet your current Direct Distance Dialing intercept requirements. Main lines, party lines, and vacant levels may be intercepted by operators or message repeaters.

Contact Leich for more details.



Write for the Leich Dial System catalog.

LEICH
Subsidiary of GENERAL TELEPHONE



ICH SALES CORPORATION • 427 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS

IC COAST: 11401 WEST PICO BLVD., LOS ANGELES 64, CAL.; SOUTHWEST: 1227 SLOCUM ST., DALLAS 7, TEX.; SOUTHEAST: 5126 SOUTH LOIS ST. TAMPA 11, FLA.

nufacturers of telephones, switchboards and related apparatus since 1907

TIME TESTED!

DEPENDABLE SERVICE SINCE 1897! That's the record of Kennecott lead-alloy sheathed Telephone Cable! Exacting quality control goes into *every* step of its manufacture. Rigorous tests check dielectric strength, insulation resistance, conductor resistance, capacitance, density and dimensions. You're *sure* this cable will retain its electrical properties over the years! Call the Chase sales office nearest you for complete information.

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TELEPHONE CABLE

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Boston	Dallas	Indianapolis	Newark	Pittsburgh	Seattle
Charlotte	Denver	Kansas City, Mo.	New York (Maspeth, L.I.)	Providence	Waterbury
Chicago	Detroit	Los Angeles		Rochester	

A Directory for the Rural Telephone Company

Printed by

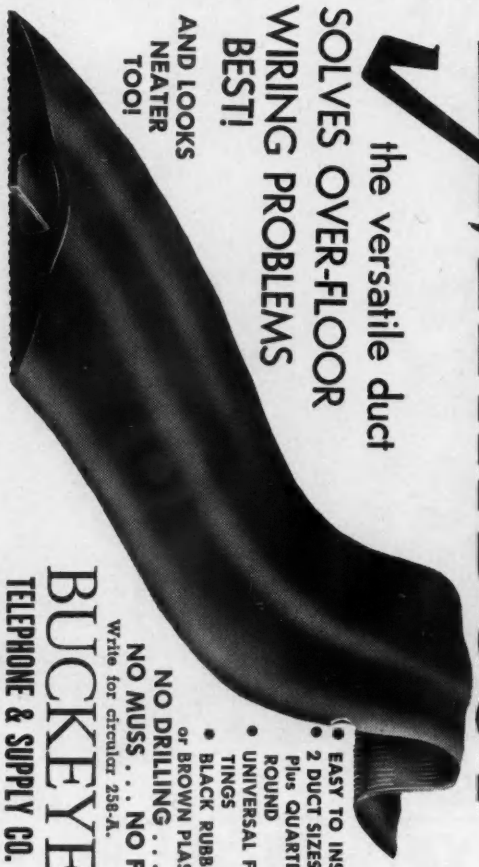
R. R. DONNELLEY & SONS COMPANY

350 East Twenty-second Street, Chicago 16

FLEXIDUCT

the versatile duct
SOLVES OVER-FLOOR WIRING PROBLEMS BEST!

AND LOOKS NEATER TOO!

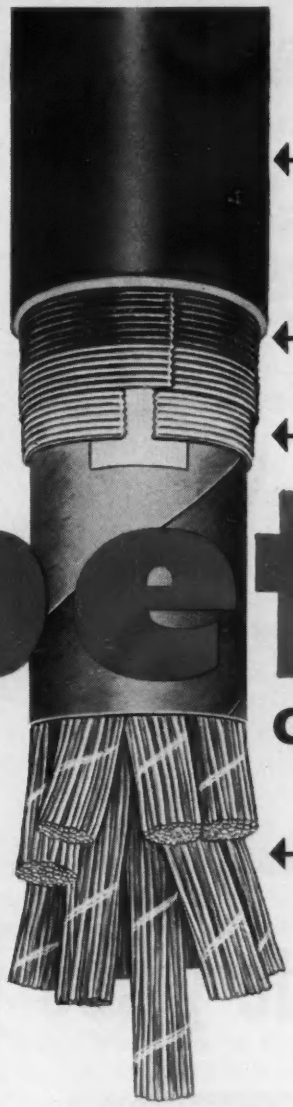


- EASY TO INSTALL
- 2 DUCT SIZES Plus QUARTER-ROUND
- UNIVERSAL FITTINGS
- BLACK RUBBER or BROWN PLASTIC

NO DRILLING . . . NO MUSS . . . NO FUSS

Write for circular 258-A.

BUCKEYE
TELEPHONE & SUPPLY CO.
P.O. Box 5707 Columbus 21, Ohio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Corrugated coated steel tape applied longitudinally with overlap seam continuously soldered.
Corrugated aluminum shield applied longitudinally over cable core.
Paper insulated copper conductors.

GENERAL CABLE

stalpeth

CABLE

LIGHT?
STRONG?
CORROSION RESISTANT?
YES!

LIGHT weight means:

- longer spans for pole-line economy
- possible reduction in sizes of messengers, guys, anchors, etc.
- longer pulling lengths for duct runs allowing manhole pull-through and fewer splices

STRONG steel and polyethylene over the aluminum shielded core provides an impervious outer covering with rugged mechanical qualities equal to tough installation conditions.

CORROSION RESISTANT inert polyethylene offers an answer to corrosion problems frequently encountered in duct installations.

And STALPETH can be used with:

- standard commercially available splice cases
- lead sleeves for wiped joints due to solderability of the steel component

Available in a wide range of core types—Paired—Quadded—Combinations of pairs and quads—Composite—Video pairs—Low capacitance

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AUTOMATIC ELECTRIC SALES CORPORATION
Northlake, Illinois

LEICH SALES CORPORATION
427 W. Randolph Street, Chicago 6, Illinois

GENERAL CABLE CORPORATION, 420 Lexington Avenue, New York 17, N. Y.
Offices and Distributing Centers Coast-to-Coast

for quality and service...specify **GENERAL CABLE**

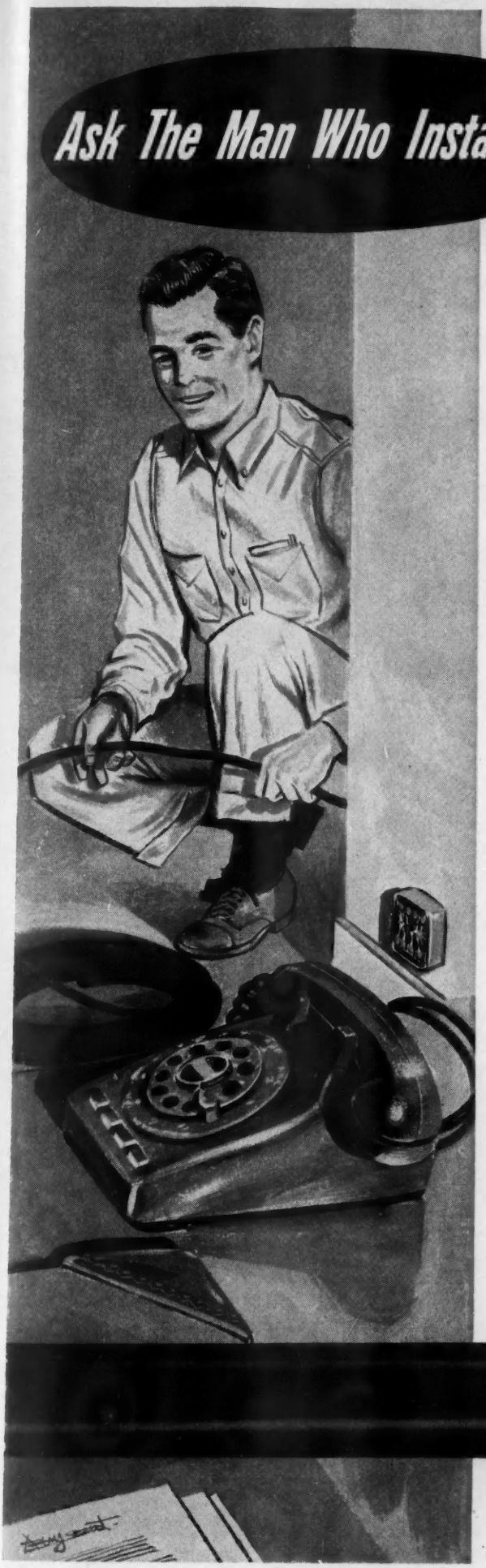
Only Exide gives you so broad a "choice"

Orange County Telephone Co., of Middletown, N.Y., chose Exide-Manchex Batteries, unmatched for long life, for its Bloomingburg exchange. Unique positive plate lead buttons fit tightly into heavy Silvium alloy grid. Silvium is Exide's patented grid alloy, proved up to 100% more corrosion resistant. Available only in Exide batteries. Each positive plate button contains a reserve supply of lead that turns gradually to active material as needed.

. . . in stationary batteries. What's your objective: long battery life, low initial cost, high current discharge, quick recharge? With Exide, you're free to choose. If you want a particular type of battery—plante, flat plate, calcium grid—Exide can supply it in a wide range of capacity ratings for any application. Because you have so broad a choice, you can select the one battery that best meets your own requirements. Yet in every case you know you are getting the extra dependability and value only Exide offers. So no matter what type of stationary battery you want, buy with confidence. Buy Exide. Full line of rectifier and motor-generator chargers available to cover any application requirements.

For complete information on Exide stationary batteries, write for the new illustrated brochure. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 20, Pa.

Exide®



Ask The Man Who Installs It...

ANSONIA®
Ankoseal

Inside Wiring Cable

easier to handle and quicker to install

Yes, the man who installs key systems, talk back systems, etc., will quickly tell you: It's a pleasure to work with Ankoseal inside wiring cables!

Ankoseal cables are easier to handle. They're lighter in weight, have greater flexibility due to smaller diameters. And they're cleaner to work with, because polyvinyl chloride jackets can't cause smudges or soil hands and clothes.

Installation is quicker—individual wires of Ankoseal cables are color-coded to industry standards and paired for instant identification. Non-breaking nylon rip cord simplifies stripping of the jacket.

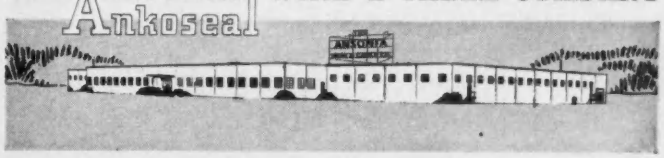
It all adds up: Ankoseal cables are easier to handle, quicker to install, a better buy all around.

Ankoseal Inside Wiring Cables are promptly available in 6 to 76 pairs, 24 and 22 AWG copper conductors. Other sizes and pair counts made to your specifications.

Call your authorized telephone supply distributor and specify Ankoseal.

Leadership Through Quality and Service

THE ANSONIA WIRE & CABLE COMPANY



111 MARTIN STREET, ASHTON 3, RHODE ISLAND

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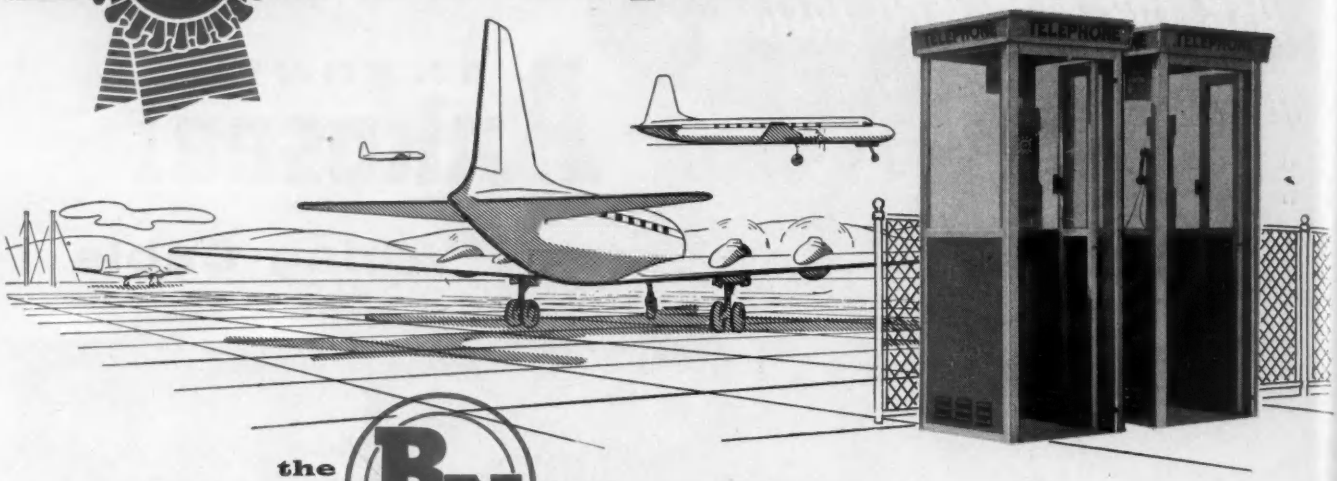


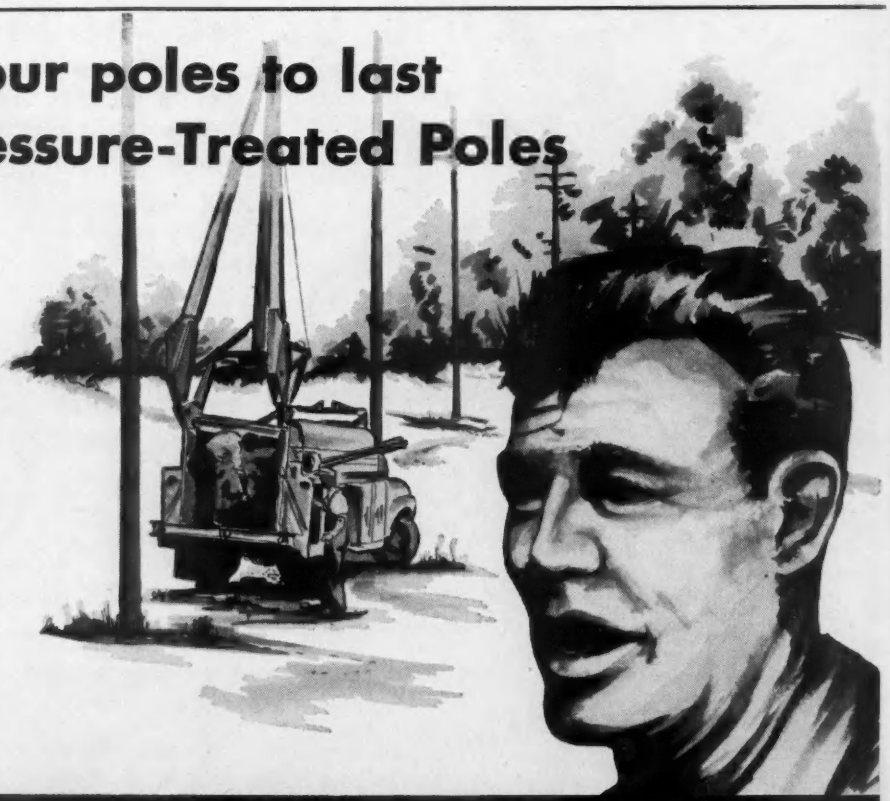
the BN Booth

attracts the eye day or night,
promotes more revenue. Colorful, clean, sturdy –
the BN Booth is best for you, too!

For full particulars, consult your distributor or write direct for folder... Benner-Nawman, Inc., 3421 Hollis Street, Oakland 8, California.

a B-N booth is a busy booth!

If you want your poles to last Specify T-C Pressure-Treated Poles



Every pole bearing the T-C brand has received the best in preservation. "The T-C Treatment" makes them last, and give you generations of trouble-free service. Our pressure treating process (and we think you'll agree) is the best yet developed by modern Technology ... and, only the best chemical preservatives are used. That's why we can say—Specify T-C and get the best in preservation.

Specify T-C

DISTRIBUTED BY AUTOMATIC ELECTRIC SALES CORP. AND LEICH SALES CORP.

TAYLOR-COLQUITT CO. TIMBER CONSERVATION T-C

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ITT Cable exceeds every exacting standard of telephony, it features unit and layer construction. The copper conductor and paper insulation is furnished by the largest U. S. supplier of these commodities. ITT Cable (aerial or direct burial) is available in all gauges—19, 22, 24 and 26. All reels are disposable to eliminate additional costs involved in returns.

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KELLOGG Communications Division of ITT
CHICAGO, ILLINOIS

8 billion conductor feet in USE in U.S.A.

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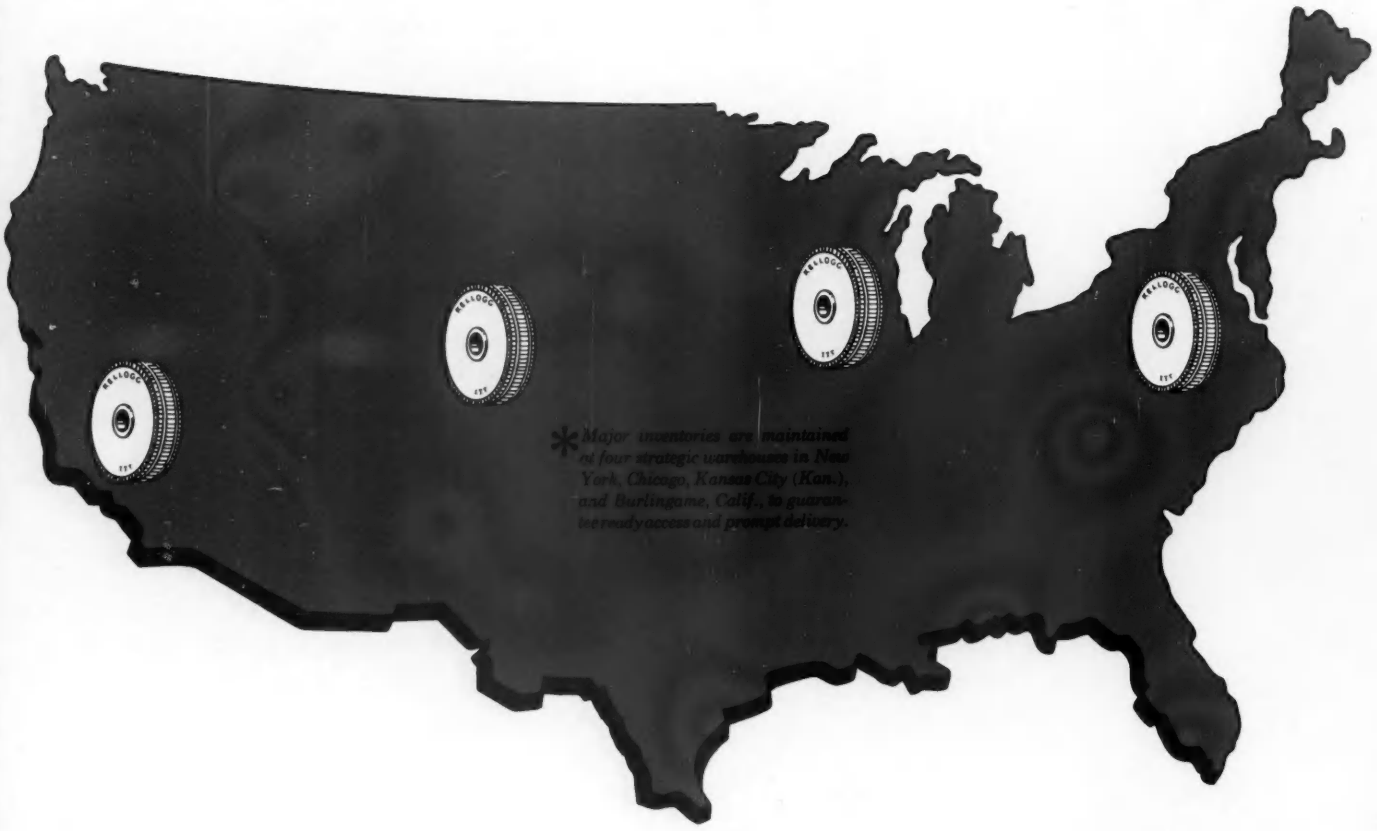
ITT Cable Is Strategically Stocked At 4 KELLOGG Warehouses


*Major inventories are maintained at four strategic warehouses in New York, Chicago, Kansas City (Kan.), and Burlingame, Calif., to guarantee ready access and prompt delivery.

gional Offices and Warehouses:
ALIFORNIA: 23 Broderick Road, Burlingame, Calif., OXford 7-5780. TWX SAN MATEO CAL 06
EORGIA: 1594 Southland Circle, N.W., Atlanta 18, Ga., SYcamore 4-2441. TWX AT 351
LINOIS: 4500 So. Tripp Ave., Chicago 32, Illinois, CLiffside 4-4300. TWX CG 3296
ANSAS: 7th & Sunshine Road, Kansas City 15, Kansas, MAyfair 1-4418. TWX KC KAN 1055
EW YORK: 327 North West Street, Syracuse, N. Y., HArrison 2-9251.
IIO: 1555 West Fourth Street, Mansfield, Ohio, LAfayette 4-6511. TWX MANS O 132
EXAS: 1515 Turtle Creek Blvd., Dallas 7, Texas, RIverside 7-5191. TWX DL 02
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KELLOGG Communications Division of ITT
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asic Specifications		26 AWG	24 AWG	22 AWG	19 AWG
heath: lead with 1% antimony					
onductor: pure copper wire					
onductor Resistance ax. ohms/mile @ 20°C.		230	145	92	46
utual Capacitance 00 cycles A.C., fd/mile, max.		0.080	0.080	0.090	0.084
apacitance Unbalance 00 cycles A.C., icro-microfarads		a	a	at 22 AWG: up to 1000′–100; 1001′ to 2000′–150; 2001′ and longer–200 at 19 AWG: up to 1000′–100; 1001′ to 2000′–150; 2001′ and longer–200	
ielectric Strength:					
0 cycles A.C., or 2 sec., volts ms	conductor-to-conductor-to-sheath	355	355	355	500
	core-to-sheath	850	1000	1000	1000

nsulation Resistance: not less than 1,000 megohm-miles at 60°F easured with a D.C. potential of 100 to 550 volts.
not required, except if adjacent pairs are found with like lengths of wist when the 900 cycle A.C. capacitance unbalance shall not exceed 00 micro-microfarads.

Telephone cables have been manufactured by the ITT System for many decades and are backed by the world-wide research facilities of the ITT. This wealth of know-how and skill assures a product of the highest quality, yet at prices competitive with those of other leading cable suppliers. In the U. S. alone, over 8 billion conductor feet of telephone cables of all types have been sold to the telephone industry and are in service in every part of the nation.

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Once the cable is completed, tests are made of its conductor continuity, absence of short-circuits, sheath perfection, insulation and capacity.

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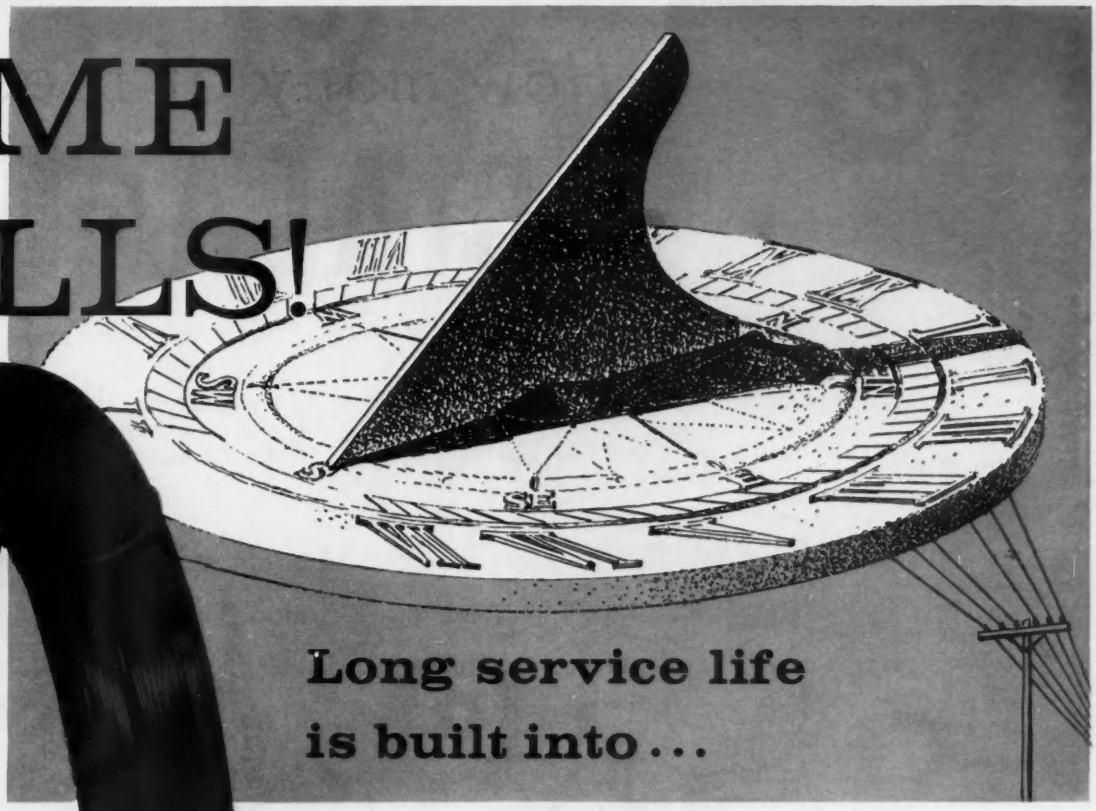

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Through the years, copper has been known for its permanence and conductance . . . steel for its strength. Each of these metals, alone, provides only a part of the qualities necessary for good line wire. All the qualities are brought together when these two time-tested metals are inseparably molten-welded to form Copperweld* Line Wire.

The thick copper covering provides high, lasting conductivity and protection against corrosion. With its protected steel core, Copperweld withstands heavy ice and wind loads, assuring safe and economical long-span construction. Records of companies everywhere show that Copperweld Line Wire gives long service life at lowest annual cost.

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WIRE AND CABLE DIVISION *Glassport, Pa.*

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CONDUCTIVITY STRENGTH PERMANENCE

PROVED IN SERVICE FOR OVER 40 YEARS

How many of these

DIALAPHONE*

*PROSPECTS have you sold?

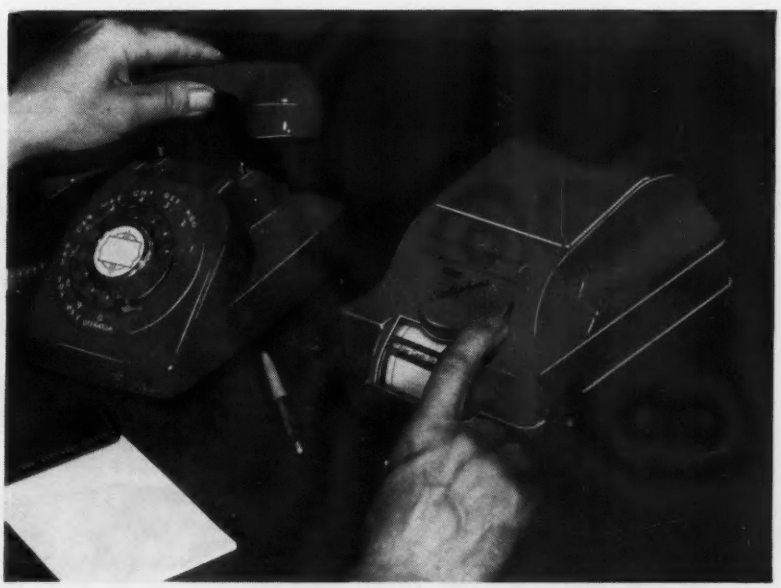
Shown here are six businesses in your community that *need* Dialaphone! Have you installed Dialaphone in each of these offices? If not, give some demonstrations today!

These are only a few of the many Dialaphone prospects in your community. You'll think of many more. Dialaphone is a big boon to business subscribers who make a lot of calls. It's especially helpful for repetitive calling. And, don't forget, Dialaphone is available in any of our 10 telephone colors.

To order, call your A.E. representative today! Address: *Automatic Electric Sales Corporation, Northlake, Illinois. Or call Fillmore 5-7111. In Canada, Automatic Electric Sales (Canada) Limited, 185 Bartley Drive, Toronto 16, Ontario.*

Dialaphone gives your subscriber Push-Button Dialing!

With Dialaphone, your subscriber makes calls faster, easier and more accurately. An indexed Directory Tape provides space for 850 separate listings. The subscriber simply turns a crank that spins the tape—when the name of the desired party appears in the View Frame, he presses the Starter Key and the call is completed *automatically.*



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Subsidiary of **GENERAL TELEPHONE**

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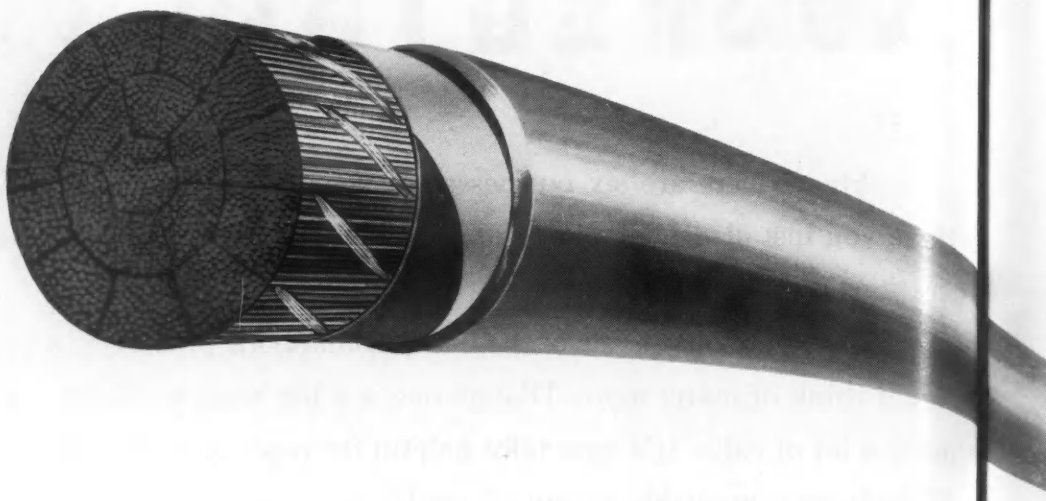

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This Phelps Dodge telephone cable combines the superior transmission characteristics of paper insulation with the durability and moisture resistance of lead. It is backed by Phelps Dodge's extensive research and manufacturing experience in the paper-lead cable field.

The controlled craftsmanship and quality of this paper-lead cable are typical of the entire line of Phelps Dodge telephone wires and cables, including:

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- Rubber-Insulated Lead-Sheathed Telephone Cable
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PENTA treated top-to-butt for years of added pole-line service resulting in far less per annum costs. Dependable service by a company who has been serving telephone companies for more than 50 years.
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WASHINGTON OBSERVATIONS

by ROLAND DAVIES and FRED HENCK

Schedule Five tariffs of 14 Bell System Associated companies, 82-B tariff of Long Lines suspended by FCC . . . Four weeks vacation after 30 years, pay raises provided in CWA-Wisconsin Telephone pact . . . Higher REA interest rate included in budget message.

Private Line Rate & Service Investigation

DECISION by the Federal Communications Commission on rates for high-grade telephone channels designed especially for the SAGE system of air defense is still a long way off in the future, it appears as the result of several procedural rulings by the FCC in connection with its current investigation of common carriers' private line rates and services.

SAGE system rates, of course, are of steadily increasing importance to a large variety of telephone companies, as the system steadily expands, frequently to outlying areas.

In its series of rulings the FCC denied petitions of nine intervenors in the private line case that it conduct a "separate and expedited" hearing on the interim private rates now in effect. It then denied in effect a separate request by the General Services Administration that hearings on the American Telephone & Telegraph Co. Long Lines Department's "schedule 5" tariffs, covering high-grade channels designed for the SAGE system but also available to commercial customers, be held separately from the overall private line investigation.

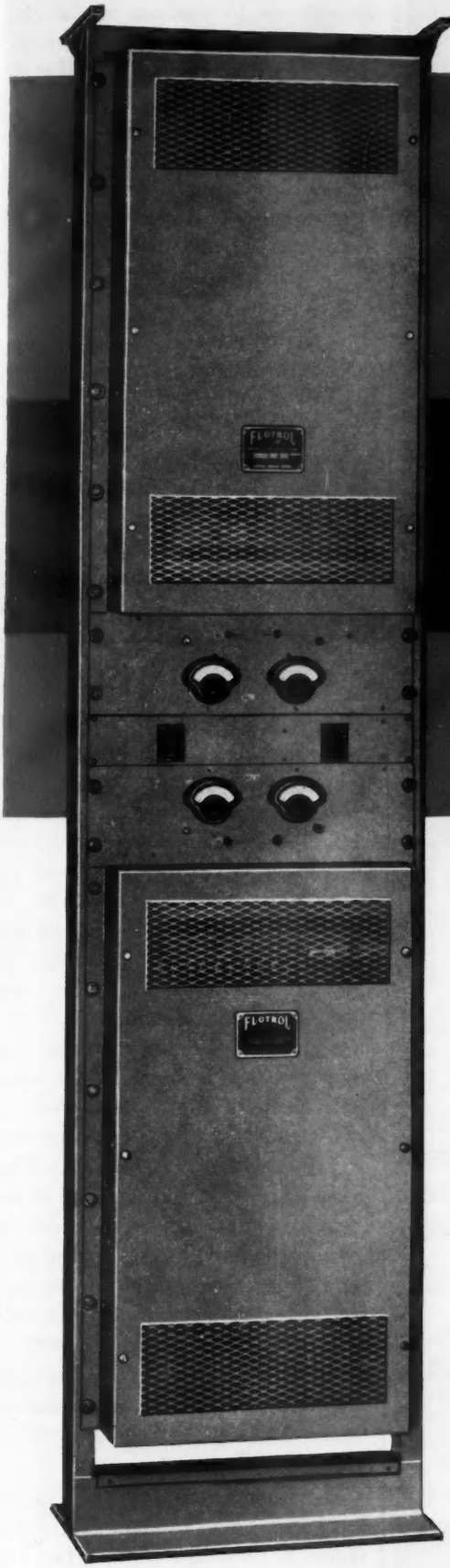
ROLAND DAVIES, left, editor of TE&M's "Washington Observations" is editor of "Telecommunications Reports," and FRED HENCK, right, co-editor of TE&M's "Washington Observations," is executive editor of "Telecommunications Reports," Washington, D. C.

Actually, the FCC did not directly deny the GSA request, and, in directing Examiner J. D. Bond to conduct hearings on the schedule 5 tariff following completion of the overall private line hearings, said it did so "without prejudice" to the pending GSA request. It appeared unlikely, however, that the Commission would reverse itself in the near future and order separate schedule 5 sessions to go on concurrently with the private line hearings or while the latter are in recess.

Net effect of the rulings, unless changed by subsequent developments, thus is that extended private line hearings will continue to go on, perhaps for six months or more. Tariff schedules covered in the general sessions are applicable to government as well as commercial customers, and where the services involved — such as regular teletypewriter and telephone — are used for SAGE, a final decision on them would affect SAGE services equally. But presumably a ruling on the schedule 5 rates would not come for a while after determination of the general private line proceeding.

Another part of the FCC's "package" of rulings suspended for 90 days tariffs filed by 14 Bell System associated companies similar to those of Long Lines Department for the schedule 5 service. The Long Lines tariff was suspended initially, and put into the general private line investigation by the Commission, but it has been in effect for some time following the close of the suspension period.

In the FCC order discussing its



2 *in the space of* 1

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DUAL

FLOTROL CHARGERS

TWO STANDARD FLOTROL CHARGERS TEAMED TOGETHER FOR THE UTMOST IN FLEXIBILITY, SAFETY, COMPACTNESS

You get standby peak capacity or additional operating capacity — without using additional costly floor space!

The Lorain Dual Flotrol Battery Charger Assembly consists of two complete Flotrols mounted one above the other in a standard 23″ relay rack. The upper unit is inverted to bring all meters and controls to eye level, along with easy-access input and output leads. Total floor space: 24-3/8″ x 15″.

The two chargers can be used either individually, or continuously in parallel. In addition, an automatic control panel (optional) allows either Flotrol to be selected as the primary charger with the second unit automatically operated in response to load demands exceeding the capacity of the primary charger.

Maintenance work or replacement of either unit leaves the other in service.

Automatic proportional sharing of the load when operating in parallel is available on most of the 14 models.

Single-phase Duals offer a range of outputs from 24 to 48 amps. (input 230 or 115 volts, 60 cycles). Three-phase Duals cover 50 to 100 amps. Capacity of a Dual unit of less than maximum rating can be increased at any future time by substituting a larger Flotrol for either unit.

Lorain Dual Flotrols are offered in many combinations of chargers, controls and accessories. You can buy complete assemblies or any part you require. Get the full story.

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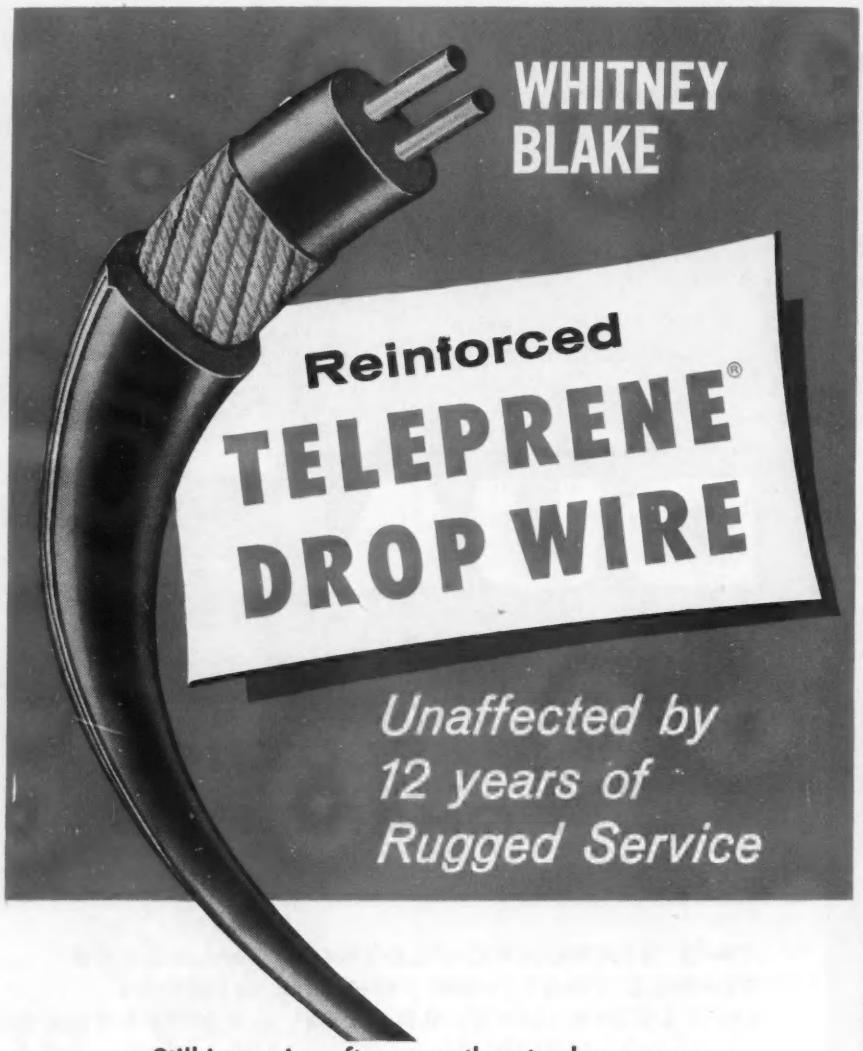

Still in service after more than twelve years . . . that's the exceptional record of WB Reinforced TELEPRENE Drop Wire . . . and there's only one reason . . . quality. By cutting drop wire replacement to the bone with Reinforced TELEPRENE, Whitney Blake has proved that even if you could get drop wire for nothing, unless it stands up as long as WB TELEPRENE, service calls and replacements would cost you more.

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WB

This wire is REA approved

1-8 WELL BUILT WIRES SINCE 1899

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decision not to separate the interim rate matter from the overall investigation, the Commission said the interim rates "are subject to the same test of justness and reasonableness in these proceedings as are any other private line telephone or telegraph rates which are under consideration" in the overall investigation.

"In support of the suspended private line teletypewriter rates, (the common carriers) are relying largely upon the same evidentiary showing they have thus far made pursuant to the aforementioned issues" (of the general investigation). "Any determination made by the Commission with respect to the lawfulness of private line teletypewriter rates as contemplated by the aforementioned issues of the general investigation, as well as with respect to the 'interim' rates under suspension, obviously involve the consideration of cost data and other evidence going to questions of rate levels and rate structure common to both determinations . . .

"In our opinion, the best interests of the private line users and the respondent carriers will be served by developing a full and complete record on costs and rate structure applicable to all private line services in issue in (the overall private line rate dockets), thereby enabling the Commission to dispose of any questions regarding the lawfulness of the rates under suspension and to determine, as contemplated by the issues in (the overall dockets), rates that should be made effective. Moreover, in order to protect the users of the services, we have required the respondent carriers to keep account of all amounts received as a result of the 'interim' increases, thereby providing a method by which refunds may be ordered in the event such refunds are found to be warranted at the conclusion of the proceedings."

The Commission said it "will expect respondent carriers and intervenors to present, without delay, any additional evidence which they regard as necessary to a full determination of the issues" in the overall rate dockets. "In order to insure the prompt disposition of the issues in (those dockets), we shall require the

ACME VISIBLE

P.B.X. KEYSHELF DIRECTORY UNITS

Hardt Richard W LI 4-0002
Harris Maurice R TA 4-4341
Harris William T BA 4-2211
Helms A Franklin MO 5-7910
Henderson Matthew JA 5-5353
Hill Denny W Rev KR 7-7158
Hodgman Stewart LI 7-0618
Hodgson W T O&E Engrg 1763
Hollowell W T MA 7-3692
Holman Howard H ME 4-9650
Hough W O GR 3-1130
Hull James L
Illsley Louis S EX 4-9006
Imel George M Admin 6460
Ingalls Bernard RO 9-5422
Inson Daniel H EX 2-6221
Insoce W Edward UN 4-1693
Irvin J W TU 6-2351
Ives Thomas E EN 9-2192
Jackson Albert H AD 4-9113
Jackson Paul O WA 3-5056
Jacobs Wiley W LA 2-9809
Jaffe Louis I AM 5-5943
James Ernest L PE 3-6795
James Leroy JE 3-1603
Jenkins Wright Wm CA 6-8150
Jenkins Jack R LE 3-0542
Jergens Jack R DI 4-1158
Johns Nicholas DI 4-8430
Johnson C Lloyd O&E Plt EX 7-9973
Johnson Ralph W AD 2-5341
Johnson Wilson CO 4-8275
Johnson Melvin MA 3-3147
Jones Reginald TI 5-1375
Justis Marshall
Kaplan Milton H EX 5-1726
Kennon B F Pers Pet 3759
King Robert T HO 3-1340
Kissell Vernon C HU 4-1342
Knight L Stanley RA 7-5650
Kyle John H MA 4-5906
Lamb Donald K UN 3-7086
Lansdale Howard HO 2-9152
LaRue Ralph S TU 6-3254
Lawrence R Wesley EX 4-5491
Lester Robert B O&E Traf 7054
Little Clyde M UN 4-1154
Lowe Linwood L JE 5-6170
Luck Paul RA 5-7231
Lyon Franklin M LE 3-2693
Pollard Herman MA 8-1366
Richman Paul UN 8-0840
Usher Joseph A AD 7-6800

With direct distance dialing, it is essential for users of P.B.X. Boards to have a visible record of all frequently called numbers. Flexoline Keyshelf Directory units are specifically engineered and designed for use on P.B.X. boards and furnish the flexibility of individual Flexoline listings on the keyshelf.

The last Flexoline strip on the front of each frame is *visible* . . . listings may be added or changed without concern for label changing or other indexing detail.

Flexoline strips are furnished in sheets of 42 strips per sheet, pre-scored horizontally to the 1/6" standard typewriter space. Supply of Flexoline is included to completely establish the reference listings and accommodate listing changes.

FOUR SIZES

7 frame units with 390 or 490 listings capacity
13 frame units with 700 or 890 listings capacity

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(kind of record)

Check department: ☐ **Accounting** ☐ **Commercial** ☐ **Plant** ☐ **Traffic** **S-259**

☐ **Have representative call.** **Date**_____ **Time**_____

Company_____ **Attention**_____

Address_____

City_____ **Zone**_____ **State**_____

Straight Neoprene-Jacketed Instrument Cords with twisted or parallel inners.

Nylon Operators' Cords and Switchboard Cords, with or without Plugs

Neoprene Handset Cords with Moulded Strain Reliefs

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hearing examiner, after completion of the record therein, to certify the record to the Commission for decision, and to thereupon proceed to receive additional evidence necessary to conclude the proceedings" in the schedule 5 case.

Soon after issuance of the Commission order, the FCC staff wrote to all parties to the private line case, asking them to advise the Commission in the near future what evidence they plan to present to complete their cases in the private line hearings.

CWA-Wisconsin Tel. Agree on New Contracts

IN AN agreement which came quickly after bargaining sessions began, the Wisconsin Telephone Co. and the Communications Workers of America have settled on new 15-month contracts which provide wage increases ranging from $1 to $5 weekly, and four weeks' vacation after 30 years of service.

In a separate agreement, changes in the company's pension program to increase the monthly minimum payments and setting the basis for computation at the highest or last years' average annual pay, instead of using the last 10 years as the basis, were decided on.

The Wisconsin pacts were the first for the year in CWA-Bell System bargaining. A number of other Bell System units reached agreements with CWA soon thereafter on similar changes in their pension programs.

The changes in the pension program announced at the conclusion of bargaining between the Wisconsin company and CWA provide — in addition to changing the computation basis — or increasing the minimum from $75 to $85 a month for those retiring before the age 65, and from $100 to $115 for those retiring at 65.

There were no changes in the pension program as far as application of social security payments are concerned, or in adding survivorship provisions, two items which had been included in CWA's announcement of 1959 bargaining goals at its mid-December bargaining policy committee meeting.

CWA President Joseph A. Beirne referred to the Wisconsin agreement as "probably the most significant one in the 20-year history of bargaining" between his union and Bell System companies, referring particularly to the four weeks' vacation provision in the contracts and to the "long-needed improvements in the company pension plan."

The CWA President declared, "This is the first time ever that Bell System pension changes have been bargained out in conjunction with contract negotiations; it is also the first time that changes have been made in the plan upon the initiative of the union." He added that the "Wisconsin Telephone Co. has demonstrated a desire to deal mutually with the problems that exist and we believe that a long step forward has been taken toward improvement of labor management relations."

Higher REA Interest Rate Included In Budget Message

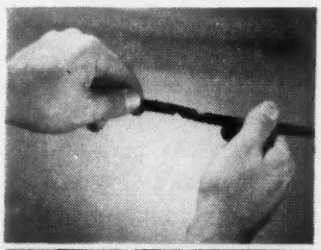
A GENERAL picture of the legislative program of the Eisenhower administration, as it relates directly or indirectly to the communications field, has been outlined in President Eisenhower's messages to Congress in the early weeks of the new Congress.

In his budget message, President Eisenhower brought up again the proposal to raise the present statutory 2% interest rate on Rural Electrification Administration loans to a "rate which will cover the current cost to the Treasury of equivalent-term borrowing and other reasonable costs," and to use revolving funds for REA loan purposes. The President stated that "The prospective size of new capital requirements, together with the present state of development of the rural electric cooperatives, emphasizes the need to broaden the sources of capital from which the REA system may obtain the funds to finance needed expansion. I am again proposing that legislation be enacted to assist both electric and telephone borrowers to obtain financing from private sources."

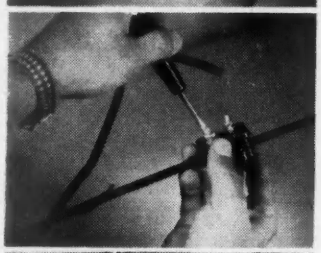
A later message to Congress on agricultural matters did not refer to the REA situation, but an accompanying

Proven Products

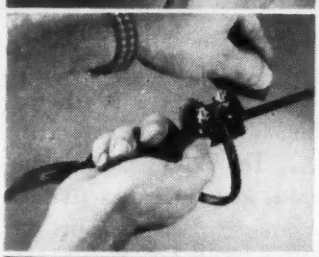
Easy installation of the SUPERIOR TERMINAL



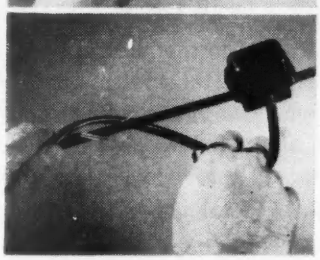
Skin line wire insulation.



Fix terminal in place on line wire.



Connect drop wire.



Snap on neoprene terminal cover.

These two great Superior products are closely matched for long life, ease of installation and economy.

The Superior PLWT-1 and PLWT-2 self-supporting Terminals are exclusively designed to provide positive contact with parallel conductors by pressure and gripping action of the terminal posts. Superior Terminals permit termination at any place, anytime, after installation of the line without cutting wire. The Terminals are completely weatherproof, easily installed and removed, and provide many years of satisfactory operation.

Superior Parallel Line Wire, 14 gauge copper covered steel, is completely insulated with high grade polyethylene. Also available with 12 gauge copper covered steel or .083 galvanized special steel conductors. All have outstanding self-supporting characteristics and low attenuation.

Use Superior Parallel Line Wire in place of open wire for greater economy and efficiency.

For detailed specifications, write

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SUPERIOR CABLE CORPORATION, Hickory, North Carolina

3515

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INSIDE WIRING CABLE

Available in Brown or Ivory Jacket in 22 and 24 A.W.G. from 6 to 76 pairs. WB Inside Wiring TELECABLE offers many advantages including:

- Light weight for easy installation
- Moisture resistance for damp ducts
- Plastite insulation resists crushing
- Easily pulled when installing in ducts
- Unaffected by humidity
- Easy to terminate
- Full color-coded insulation assures lasting polarity identification
- Jacket is tough, flame and abrasion resistant
- Steel rip wire makes stripping easy
- Permanently marked with gage and number of pairs

INDEPENDENT

WB

5-8

WELL BUILT WIRES SINCE 1899

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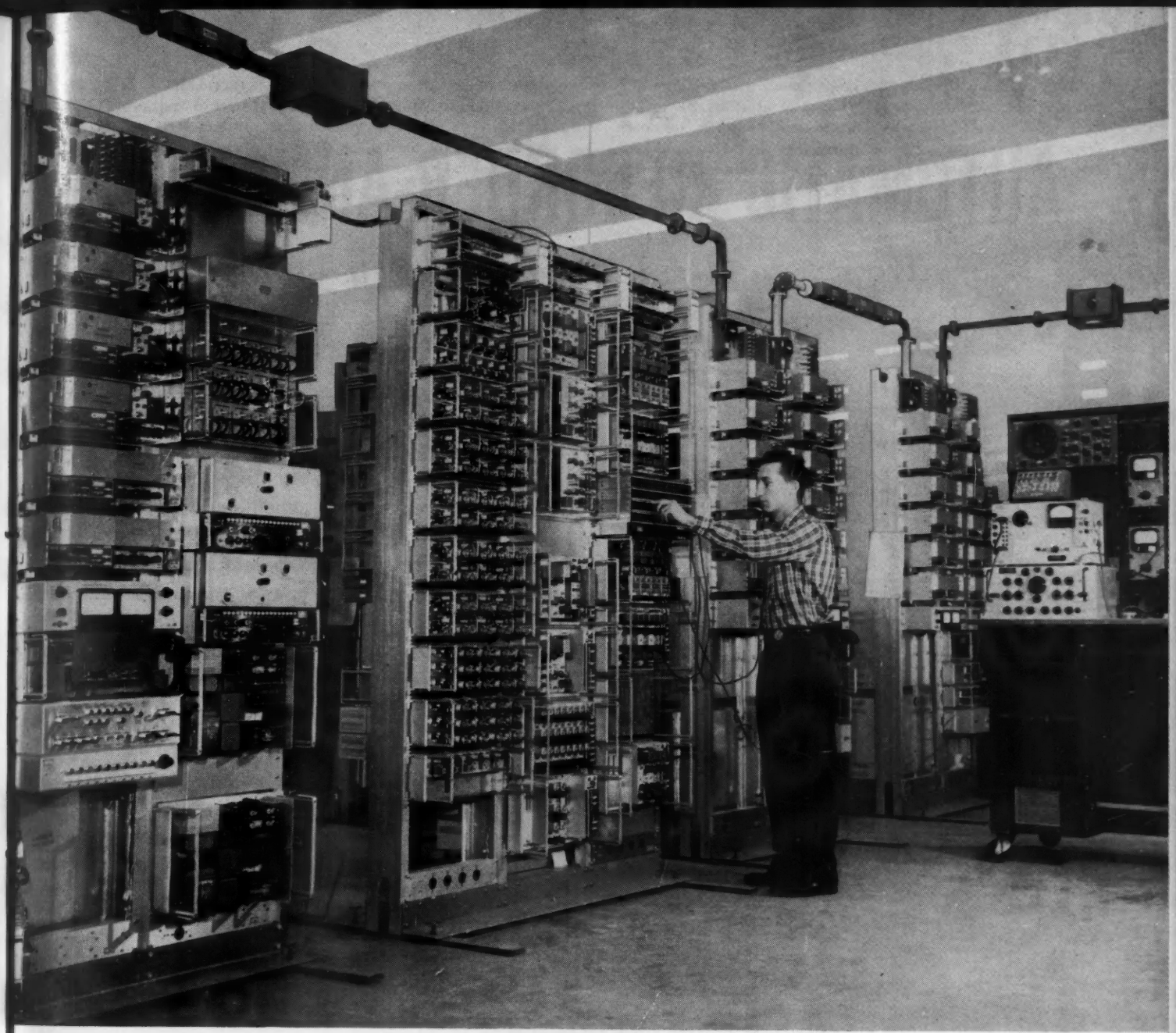
memorandum from Agriculture Secretary Ezra Taft Benson referred generally to the REA proposal.

In the REA section of the budget, the President estimated that at the outset of fiscal 1960, beginning July 1 of his year, REA will have $105,000,000 available for new telephone loans, including $80,000,000 in new authority in the coming fiscal year. An $80,000,000 loan program for the year was forecast. At the close of fiscal 1960, it was estimated, REA will have made $654,234,000 in loans; have advanced $504,608,000 to borrowers; will have provided for 235,000 route miles of line built or improved; and will have made 751 loans affecting 997,000 subscribers.

Reviving plans of the Joint Federal-State Action Committee to transfer some federal local telephone tax authority to the states, along with some spending programs, the President declared that "As part of my proposals . . . to return responsibility for certain federal programs to the states —in this instance, responsibility for vocational education and for waste treatment facilities — federal excise taxes on local telephone service should be revised effective July 1, 1960, to allow limited credits for telephone taxes paid to the states."

Given prominent attention in the budget message, in a slightly different approach from preceding years, was a call for "savings to the general taxpayers from more adequate fees and charges." The President declared that "Certain government activities confer measurable special benefits on identifiable groups or individuals beyond the benefits to the general public. The cost of federal services which convey special benefits should be recovered through charges paid by the beneficiaries, rather than through taxes on the general public."

Fees for filing applications with such agencies as the FCC have been discussed for some years, and the Bureau of the Budget is once again compiling comments from government agencies on the subject. Specific plans of several federal regulatory agencies, including the FCC, to collect fees were blocked several years ago by the Senate Interstate & For-



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Choose from 5 models—to save money—to make money!

TIME ANNOUNCER automatically broadcasts the correct time every 15 seconds with a message between announcements. Some telephone companies use the "between" time for giving public service messages. Others sell it for sponsored commercial messages. Any way you use it, the Automatic Time Announcer is a revenue-builder for you!

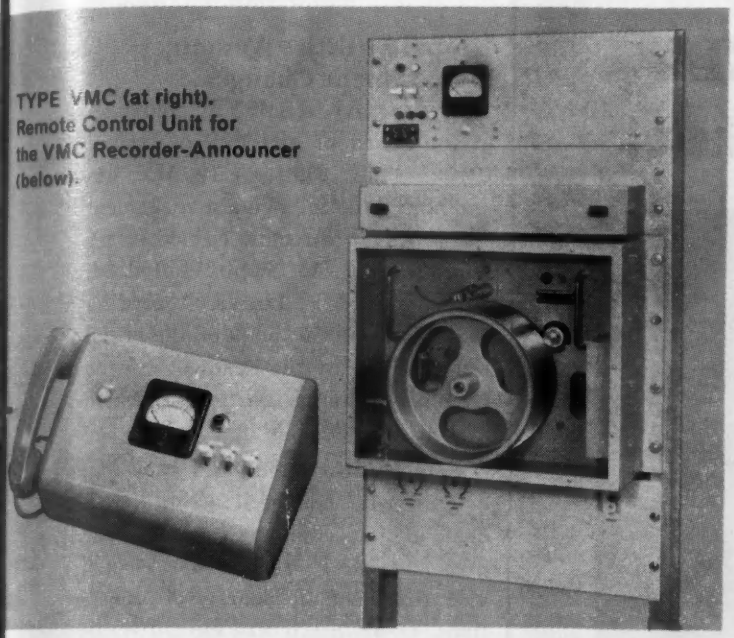
With a Recorder-Announcer, you make intercept announcements and give public service messages, *automatically!* You save on labor costs because operators are relieved for other duties. And, you can make an announcer pay for itself quickly by selling advertising time to sponsors. Automatic Recorder-Announcers save money, and make money for you.

Automatic Electric offers a complete line of Recorder-Announcers for giving any type of message. These precision-engineered machines use magnetic recorders for lifelike reproduction. Messages are free from annoying breaks or changes of pitch. Current consumption is low, even when an announcer is run continuously.

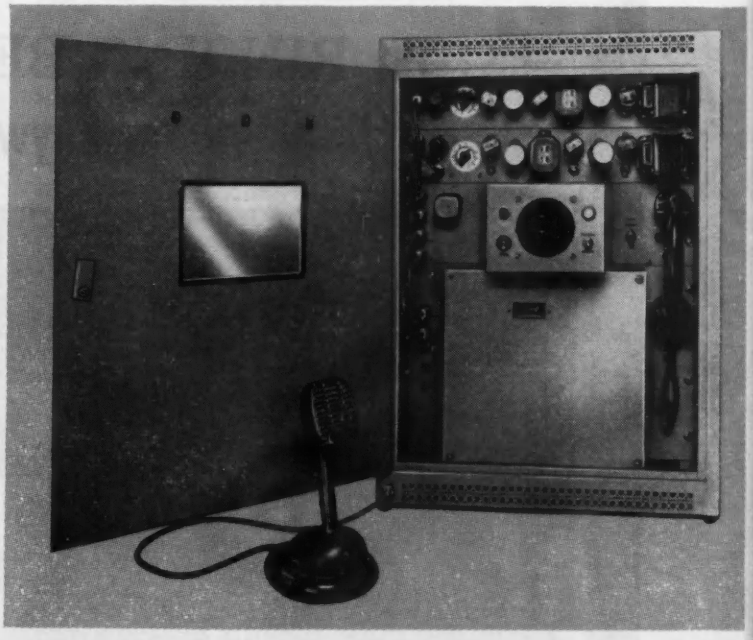
One or more of the announcers shown here would be ideal for your exchange. For further details, write: *Automatic Electric Sales Corporation, Northlake, Illinois. Or call, Fillmore 5-7111. In Canada, Automatic Electric Sales (Canada) Ltd., 185 Bartley Drive, Toronto, 16.*

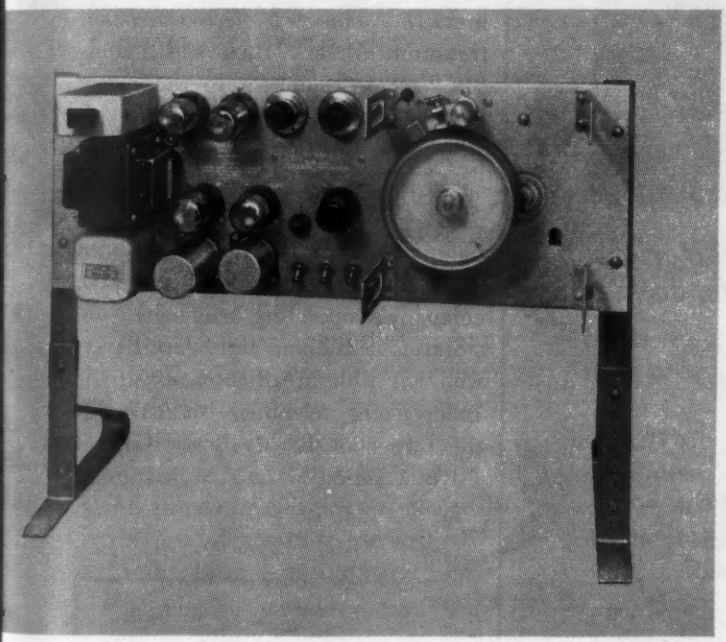
TYPE VMC gives any message up to four minutes long: weather forecasts, paid commercials, public service messages or a combination of any of these. Anyone can record the announcement from anywhere (even from another city by remote control). Old message erased and a new one recorded in one step.

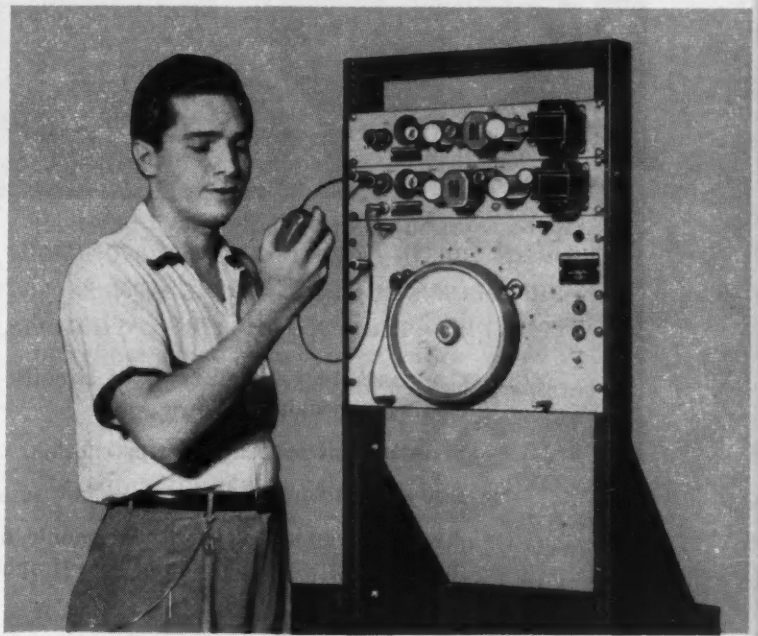
TYPE FML is designed to give a single message (either 6½ or 12 seconds long). Telephone companies use this machine to inform volunteer firemen of the location of a fire. You might also find it useful for announcing theater and train schedules. And, there are a dozen other uses for this Recorder-Announcer.



TYPE VMC (at right). Remote Control Unit for the VMC Recorder-Announcer (below).







TYPE SCC This compact, low-cost announcer gives any message, 12 seconds long. Ideal for intercept service when only one announcement is needed (or, you can profitably use two SCC machines for two different messages). Can also be used for giving commercial announcements.

TYPE MCF is used for repetitive services such as interception of calls to disconnected lines, dead levels, etc. Provides up to five separate messages. Initially, you buy equipment for only the number of channels you need. Other channels can be added at any time.

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LOUD RINGING BELL

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For a complete list of Kellogg offices, see pages 34-35.

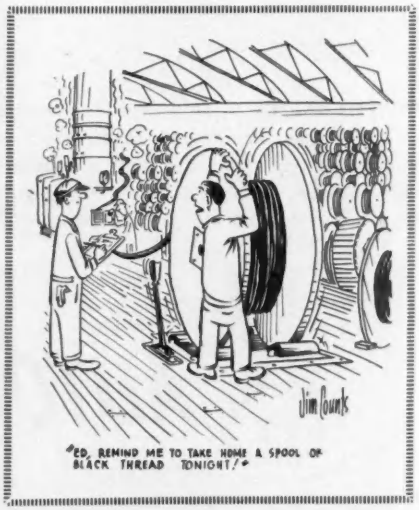
eign Commerce Committee, and the agencies shown no disposition to revive them without more vigorous prodding from Budget than has been indicated so far.

United Utilities Announces Management Changes

R. CROSBY KEMPER, chairman of the board of directors of United Utilities, Inc., Kansas City, Mo., has announced the following management changes. New directors elected to the board are C. A. Scupin, Loren M. Berry and R. F. Lucier. According to Kemper the vacancies on the board were created by the death of Gustav Hirsch, and the resignations of Alden L. Hart and A. Z. Patterson.

Kemper also anonunced that Mr. Scupin, who has been acting president of the company, was elected president. R. F. Lucier was elected vice president in charge of operations. O. D. Small was elected treasurer. D. Adams was elected assistant treasurer. Messrs. Hart and Patterson become members of the newly created advisory board.

Scupin has been associated in executive positions in the United Utilities system for the past 38 years. For the past 24 years Lucier has been president and general manager of the company's operating telephone subsidiaries in Indiana and Ohio. Berry, who has widespread interests in the Independent telephone industry, is the owner of L. M. Berry Co., of Dayton, Ohio.



EDITORIAL

Part I— "Formula For Halting Progress"

TUCKED AWAY in most any list of the telephone industry's major problems is one we believe merits even more attention than some of the items now heading the list.

We will grant the excise tax on telephone service and the utility reimbursement provision of the Highway Act are important, and it is right that all industry members should give their attention to these subjects.

But we believe equal attention and energy should be given and applied to a problem created by the belief of some regulatory commissions that if a telephone company's earnings look good its service rates are too high.

The records of last year and the records of most any year in the past plainly prove such thinking has played an important part in the creation of a rate formula based on an erroneous belief that low earnings mean low rates while good earnings mean high rates.

This misconception has made itself known and felt in many rate decisions. And we believe it will continue as a major factor in many rate hearings this year and for all the years that follow unless more of the nation's telephone companies activate programs aimed at proving ample profits will produce better goods and services than less profits — and produce them at less cost.

There is much evidence at hand to support the contention that adequate earnings ultimately produce lower costs to the consumer.

In 1957, the convention report of the NARUC Committee on Rates of Public Utilities emphasized the long range value to utility customers of earnings adequate to permit utility managements to make long term commitments.

"*Expanded research and long range employe training,*" the Committee report stated, "*may well produce increased efficiencies in the future years, even though expenditure for such purposes today results only in reducing current earnings. With some margin in current earnings, utility management can safely adopt these programs which operate for the long pull . . .*

"*However, if a utility company management considers that earnings are already at an adequate level, they will be apt to adopt only the short-term programs which minimize or eliminate risk and the immediate impact on earnings.*

"*Recognition of this particular function performed by adequate earnings is somewhat new to the field of regulated utilities. In unregulated industry, it has long been apparent that the management of those companies whose earnings have afforded them the opportunity to operate for the long pull are producing, on a quality-price basis, the goods that the consumer prefers . . .*

"*The policies of regulatory commissioners must be compatible with the programs of those utilities who plan for the long pull as distinguished from the make-do or short-haul plan. Regulation that is oppressive may work to the immediate advantage of the user of service today but it may also ultimately work to his grievious disadvantage for many tomorrows . . .*"

Without mentioning names we wonder if some of the commissioners whose names are appended to rate orders issued in 1958 attended the 1957 NARUC convention, or studied the report of the NARUC Committee on Rates.

At the same time we also wonder how many telephone men visited their commissioners and reviewed the report with them.

We know some industry members did just that. We also know the work of these few industry members would have been more effective had more industry members followed the same plan.

It seems to us that now is the time for concentrated industry action aimed specifically at the elimination of what we term the "*Formula For Halting Progress*" — low rates which result in poorer service at higher cost than would be attained if the company were allowed to achieve good but fair earnings.

As we see it the formula has been around far too long. It has had its day. It has done its damage. It should be replaced with a new formula based on the proven fact that a company with good earnings can undertake projects which will, in the long run, result in better service at lower cost. When it is replaced depends, we believe, on how soon the industry starts attacking the problem. — (*To be continued in the March 1 issue.*)

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Check these improved features found in no other Step-By-Step system

- ☑ **Simplified designs**
- ☑ **Solderless terminal strips**
- ☑ **Fewer relays**
- ☑ **Improved wiring**
- ☑ **Reduced weight**
- ☑ **Simplified digit absorbing**
- ☑ **Vertical bank eliminated on linefinders**

From framework to individual switches, Kellogg's Step-By-Step is engineered to simplify operation, to make maintenance a cinch. Result: the most *dependable* step-by-step equipment ever offered...meeting all requirements for direct distance dialing...compatible with all other equipment.

For further information, ask your Kellogg representative—he'll give you all the details of Kellogg's Step-By-Step—and how it can grow with your community needs.

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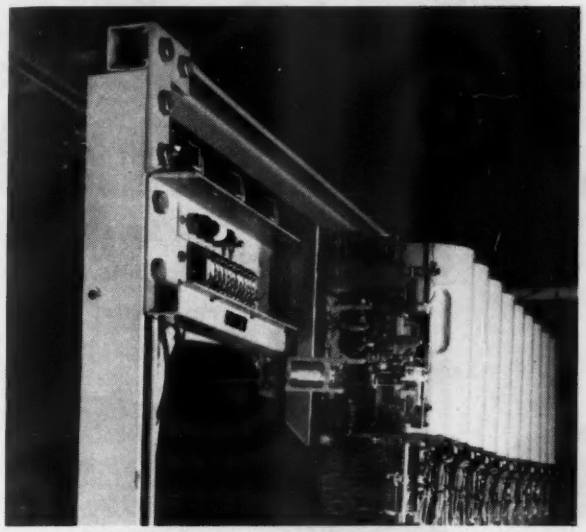
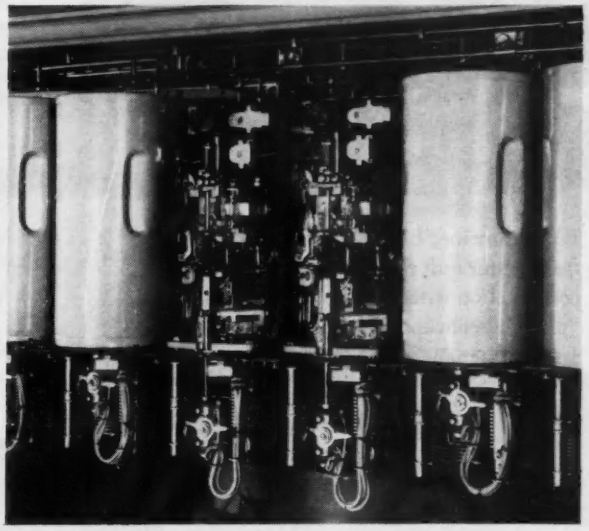
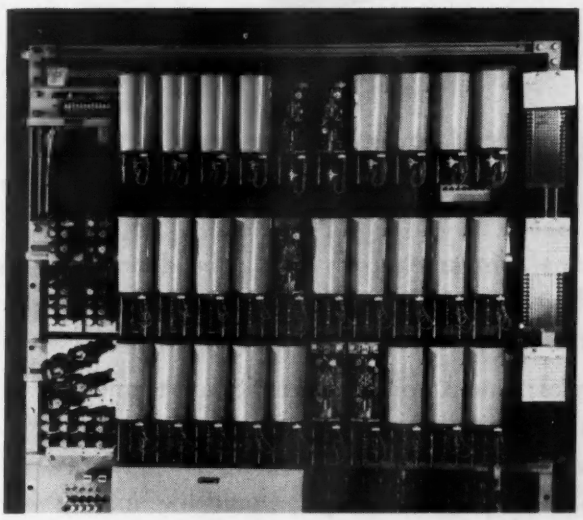
Step equipment ever engineered



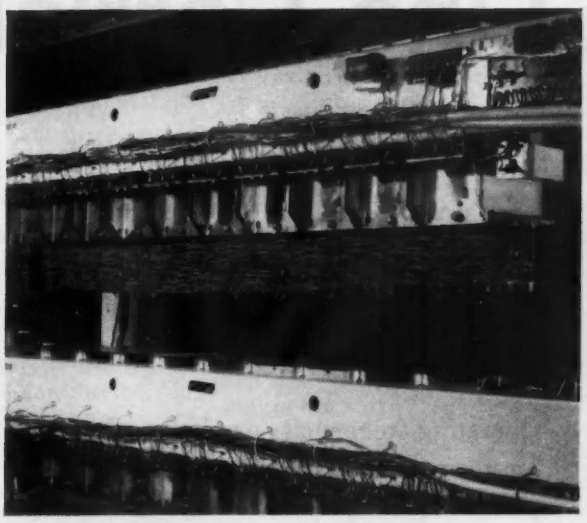
1—Bay framework lighter. Built up from Unistrut frames that permit any shelf arrangement. Framework smooth-finished, easy to maintain, durable, modern looking. Made from cold drawn steel.



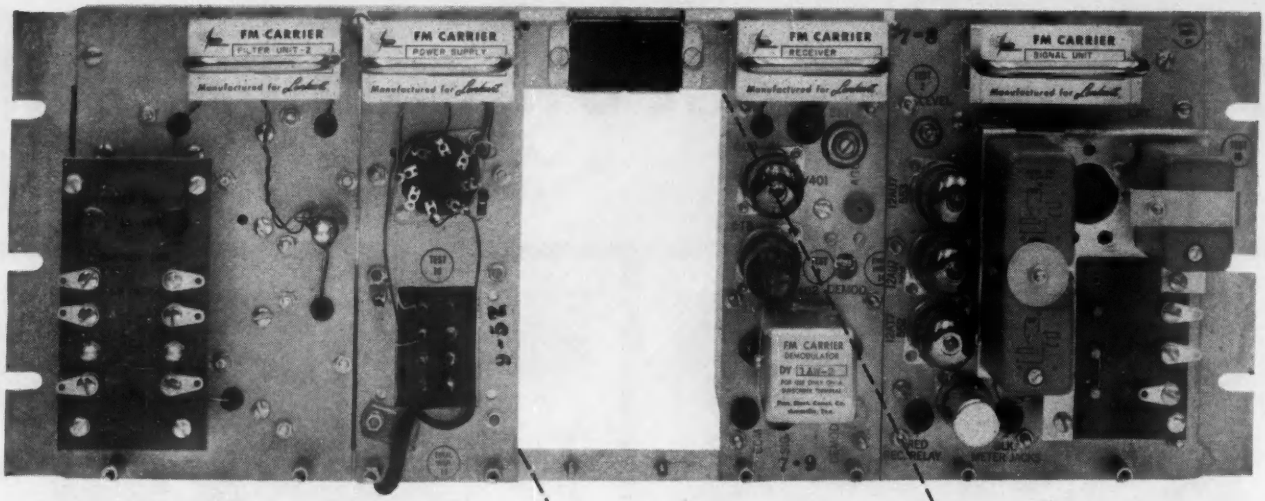
2—Simplified circuit design cuts number of relays in all selector switches. Marked by vertical bank instead of post bank; simpler digit absorbing. All selector switches have faster-than-normal operation.



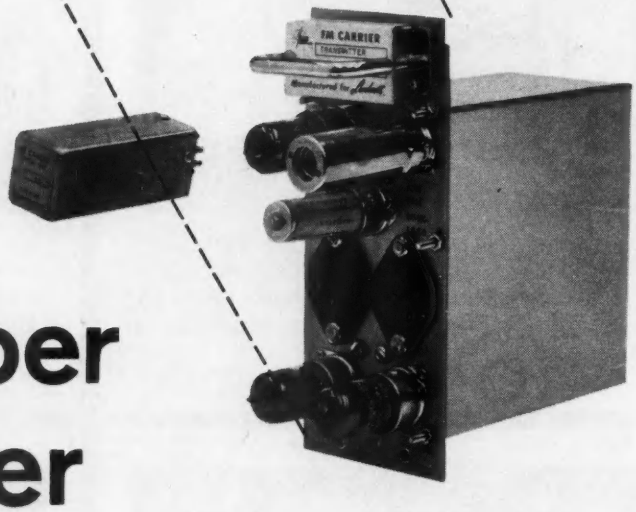
3—Linefinders also feature simplified design, with number of relays reduced to two and vertical bank eliminated. Automatic self-checking of linefinder and control circuits.



4—Superior wiring: insulated with a semi-rigid polyvinyl chloride covering. Line circuits are mounted on fiberglass bars; shelves are strap wired: no excess wires except those needed for future growth. Solderless, automatic wire wrapping on terminals and relays.



FM Subscriber Line Carrier terminal with transmitter unit removed to show unitized construction with plug-in components. This "plug-in" concept simplifies trouble shooting and maintenance—avoids shutdowns.



FM Subscriber Line Carrier

The economical answer to your rural service problems!

FM Subscriber Line Carrier provides a low-cost, versatile method of adding up to 10 multi-party subscriber circuits on an existing wire pair.

Operating frequencies are higher than with most conventional carrier equipment, thus permitting installation on the same circuit or pole-lead as existing carrier, with little or no problem of coordination. Hundreds of these systems now in use by leading telephone companies are proving the dependable, economical answer to improved rural service.

Lenkurt and Automatic Electric have teamed up to provide complete engineering, supply, and repair service for FM Subscriber Line Carrier equipment. If you would like more information, call your nearest Automatic Electric Representative — or write for illustrated literature.

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Northlake, Illinois • Subsidiary of **GENERAL TELEPHONE**

NEW "REVENUE BOOSTER"—

PERSONAL SIGNALING

By NEWTON MONK
AND E. D. GUERNSEY

CUSTOMER service interviews conducted by Ohio Bell indicate initial service with personal signaling service has been generally favorable. (Part One of this article appeared in the Jan. 15 TE&M.

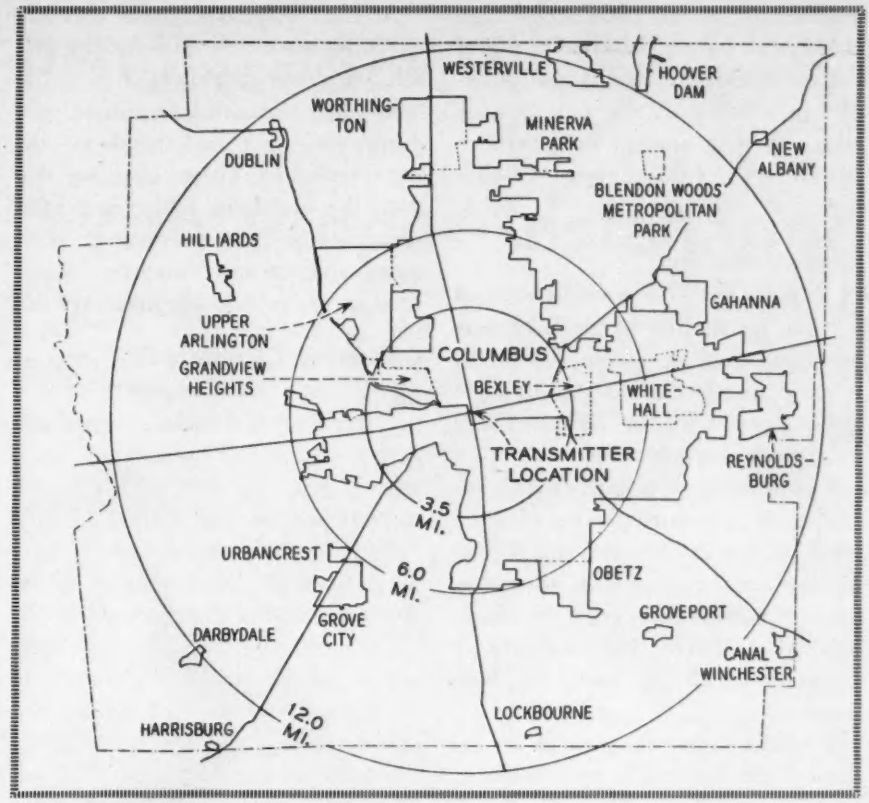


FIGURE FIVE: — Coverage areas for signaling systems.

Radio Coverage

THE AREA over which signals can be received by the pocket receivers consistently enough to be designated as a "service area" is considerably smaller than the service areas ordinarily obtained in vehicular communications systems using comparable base station power.

This is due primarily to the necessarily small and relatively inefficient antennas employed with the signaling receivers. Accordingly, their sensitivity, when carried on a person, is only of the order of 40 to 50 db above one microvolt per meter.

As might be expected, also, from the variables involved, no single "radius" can be used to express adequately the extent of the signaling system service area. For example, the receivers may be carried in a variety of ways; in breast pockets of suits or shirts, clipped on belts or carried in handbags. The persons carrying the receivers may be in buildings, on foot on open streets, or in automobiles or public conveyances.

These variations in local environments of receivers in day to day use influence reception, particularly when receivers are carried in buildings or cars where shielding or "penetration losses" may range from small to very substantial factors.[3] Consequently, discussion of ranges or service areas necessarily requires at least some general classification as to receiver environment.

Figure Five shows a map of Columbus and vicinity with three circles superimposed. Two of these circles indicate approximate *average minimum* coverage ranges for receivers meeting minimum sensitivity requirements.

The inner circle, 3.5 mile radius, applies to receivers carried in the lapel pockets of persons seated in cars.

The outer circle, with a 12-mile radius, applies to receivers carried in the lapel pocket of persons standing in the open.

These ranges are based on the results of tests in which several receivers were signaled at each of a number of test points. The radius of each circle is an approximate average of radial distances from the transmitter to test points at which *all* receivers received *all* test signals for that receiver environment.

Individual receivers could, in many instances, be signaled at distances substantially greater than indicated by these "average minimum" circles.

For example, the intermediate circle on *Figure Five* with a radius of six miles, indicates an approximate average distance from the transmitter of a number of test points at which at least one of several receivers could be signaled when carried in the lapel pockets of people in cars. Consequently, this 6-mile radius is believed to indicate roughly a limiting boundary for pocket-carried receivers in cars.

Penetration losses in buildings have not been investigated specifically in Columbus. However, in tests with receivers carried by telephone company personnel prior to placing the system in service, signals were received in some buildings as far as 7 to 9 miles from the transmitter.

In other instances, either all or one or more of the three transmissions were not received at some locations in some of the larger buildings in the downtown area less than a mile from the transmitter. From the practical standpoint, the variations be-

tween buildings may make it desirable to establish by test whether receivers can be signaled in individual buildings in which their use may be high rather than to attempt to generalize on ranges for various types of buildings.

Channel Sharing

AN IMPORTANT consideration in the installation of the Columbus personal signaling system was to determine the effect of sharing the same radio channel by the signaling and mobile telephone services.

The primary advantage of such operation is, of course, more efficient usage of the radio spectrum. A secondary advantage is that, when frequency modulated pocket receivers become available, the same radio transmitter can be used for both services.

Operating the two services on the same radio channel is not, however, without certain disadvantages. In the first place, delays to some of the calls of both types are bound to result. Furthermore, due to the loss of signaling time, the number of personal signaling calls which can be transmitted is reduced so that fewer signaling customers can be served.

Another disadvantage is that the signaling tones will be heard by mobile telephone customers in automobiles when attempting to initiate calls during times personal signals are being transmitted. These customers will hear the signaling tones and must recognize the difference between these tones and certain two-tone signals used in the mobile telephone system.

Operating Experience

AT THE TIME this paper was prepared the Columbus personal signaling system had been in operation slightly less than two months. Commercial service was started May 1, 1958, with 40 personal signaling receivers and 85 mobile telephone service units sharing the channel.

During the month of May the number of pocket receivers increased to 89 while the number of mobile telephone units remained substantially the same. For the first half of June, only minor variations in the number of units of each type occurred.

Since inception of the service, several types of studies have been conducted. These included (1) evaluation of public acceptance of the service, (2) records of requests for repetitions of transmissions of signals not received, and (3) effects of sharing the channel by the signaling and mobile telephone services including records of channel usage time and delays in transmission due to channel busy conditions.

The initial experience with the system has been considered generally favorable. During a six week period 178 customer service interviews were conducted. Satisfaction was indicated in 168 of these interviews while dissatisfaction for some reason was expressed in 10. Among the latter, reasons given included "insufficient use" in 5 cases, "coverage" or "range" in 3 cases, and "discontinued business" in one case.

From records of a total of 1265 personal signals sent out during normal business hours (8:00 A.M. to 5:00 P.M.) on 29 week days, there were 265 test calls to check receivers and 45 second or subsequent requests for signals in cases in which the first signals were not received.

Second or subsequent requests for signals were found in some cases to be due to faulty receivers. In other cases receivers were presumably turned off or out of range since the requests or reports were not repeated.

Please turn to page 79

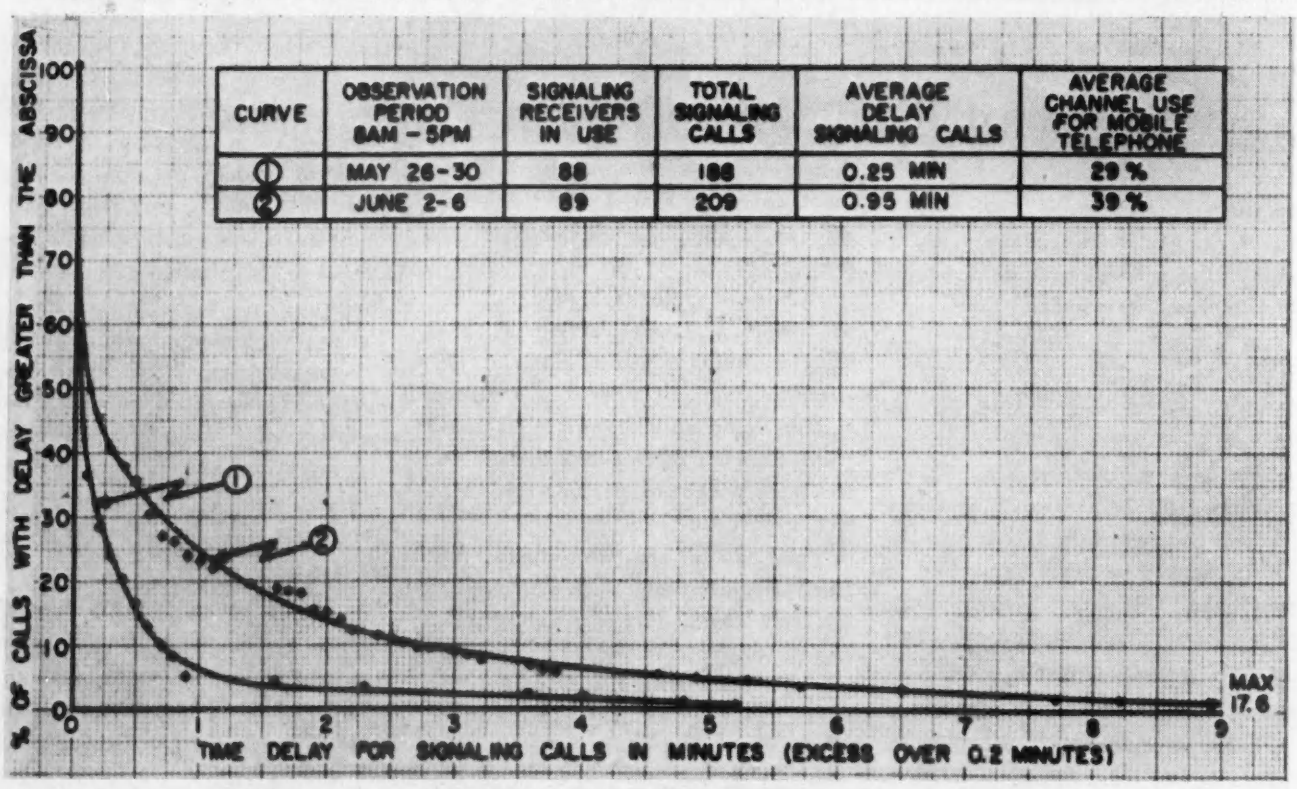


FIGURE SIX: — Delay to signaling calls due to channel sharing.

GOOD TELEPHONE SERVICE

Starts With Proper Installation

By JOHN S. REED

GOOD installation practices stimulate the plant employe's confidence by enabling him to deal intelligently with the situations that arise in the course of his daily work.

CHAPTER THREE — Drop Wire Runs

CHAPTER III of TE&M's operating manual on station installation discusses installing drop wire runs on buildings. Part I of this manual appeared in the Sept. 15 issue. Part II was published in the Nov. 1, issue

Installing Drop Wire Runs on Buildings

DROP wire runs should be installed on buildings to meet requirements for proper entrance into the building or termination in an outside protector.

On wood frame houses not having stone or brick veneer to which drop fixtures can be attached without penetrating or contacting wood or metal backing, the drop runs should be supported on porcelain knobs and porcelain (or plastic) tubes should be used in the wire entrance hole. This requirement applies when fused type protection is employed, but need not apply when the station protection is of the fuseless type (protector blocks only in approved type protectors).

Different types of fixtures are employed for attaching drop spans to buildings, depending on the building construction, whether frame, stucco composition siding, aluminum siding, hollow tile, brick or stone veneer, or solid brick or stone. The angle of the drop span with the building and the number of drop wires in the wire run also determine the type of fixtures to use. The fixtures recommended for use in various situations are listed in *Table One* on types of drop fixtures and fasteners. The drop wires are attached to the fixtures with drop wire clamps illustrated in *Figure* 12. *Figures* 13 *to* 20 illustrate the methods of supporting the drop wire run.

The primary attachment for the drop span should be placed directly above the wire entrance into the building so that the drop run will come down vertically to the entrance. If snow or ice is likely to slide off the roof onto the drop span, the primary attachment should be placed elsewhere on the building, if possible, or higher up near the eaves so as to lessen the shock of falling ice or snow on the drop.

The drop wire run should be made in a vertical or horizontal direction, not on a slanting line. Wire runs on the building wall should not interfere with the use of doors, windows, awnings, fire escapes, or other building fixtures.

Only the minimum number of drop fixtures required

TABLE ONE: — Types of Drop Wire Fixtures and Fasteners for Attaching the Fixtures to Different Kinds of Surfaces.

Uses, Types, or Fasteners for Attaching Fixtures

Type of Drop Fixture and Use	Frame with Wood Siding (Note 1)	Stucco, Composition Shingles or Brick Roll Siding (Note 1)	Hollow Tile	Substantial Brick or Stone Veneer (Note 2)	Solid Brick or Stone (Masonry)
Type "S" Knob — At primary attachment on building, where angle of drop is less than 30°. (All loading zones)	2½" x #18 F. H. Galv. Wood Screw (Note 3)	3" x #18 F. H. Galv. Wood Screw (Note 3)	5/16" x 5" Toggle Bolt with flat side of knob under bolt head. (See Drop Wire Hook)	Do not use.	Do not use.
Type "S" Knob — At primary attachment where angle of drop with building is 30° or greater. (all loading zones)	On 5/16" Angle Screw (Note 3)	On 5/16" Angle Screw (Note 3)	Do not use (See Drop Wire Hook)	Do not use.	Do not use.
Type "T" Knob — At primary attachment on building for 2 drop runs where angle of drops is less than 30°. (Medium and light loading zones)	3½" x #18 F. H. Galv. Wood Screw (Note 3)	4½" x #18 F. H. Galv. Wood Screw — if needed to reach wood stud or backing. (Note 3)	6" x 5/16" Toggle Bolt with flat side of knob under bolt head.	Do not use.	Do not use.
Type "T" Knob — At primary attachment on building for 2 drop runs where angle of drop is 30° or greater. (Medium and light loading zones)	On ⅜" Angle Srew (Note 3)	On ⅜" Angle Screw (Note 3)	Do not use.	Do not use.	Do not use.
Type "C" Knob — Split type for 1 and 2 wires in run. At secondary attachment 6" from primary attachment, intermediate, and final attachments, also at turns in run.	2½" x #10 R. H. Galv. Wood Screw (Use 2" x #10 in hard wood)	3" x #10 R. H. Galv. Wood Screw	3/16" x 4" R. H. Toggle Bolt	Do not use.	Do not use.
Drop Wire Clip — S-shaped metal clip used for secondary attachment on same "S" or "T" knob or drop wire hook with drop wire clamp. Used in place of "C" knob associated with primary attachment.	With "S" or "T" knob, also with either knob on angle screw, house or corner bracket	With "S" or "T" knob, also with either knob on angle screw, house or corner bracket	With "S" or "T" knob or with either knob on house or corner bracket	With drop wire hook.	With drop wire hook
Insulated Screw Eyes (porcelain eyes with diagonal slot. Used at turns in runs (2 required), also to support runs.	Short shank type ⅝" for 1 to 5 wires; 1" for over 5 wires	Long shank type ⅝" for 1 to 5 wires; 1" for over 5 wires	Do not use.	Do not use.	Do not use.
House Bracket — Assembled with 1 "S" knob and 5/16" x 2" stove bolt or with 2 "S" knobs and 3" stove bolts for 1 or 2 wires. (Note 4).	2" x #14 R. H. Galv. Wood Screws (3 required)	2½" x #14 R. H. Galv. Wood Screws (3 required)	¼" x 4" Toggle Bolts (2 required, one in upper, and one in a lower hole in bracket)	Do not use.	Do not use.
Corner Bracket — Assembled with "S" or "T" knobs using same sizes of bolts as specified for house bracket. Used at primary attachment where wire is to turn corner, also at inside corners in run.	2" x #14 R. H. Galv. Wood Screws (2 required)	2½" x #14 R. H. Galv. Wood Screws (2 required)	¼" x 4" Toggle Bolts (2 required)	Do not use.	Do not use.
Drop Wire Hook — At primary attachment for 1 or 2 wires, all drop angles, all loading zones.	(Note 3)	(Note 3)	5/16" x 4" Galv. Toggle Bolt with 7/16" x 1" Galv. washer on 9/16" x 1⅜" Galv. washer between hook and wall	5/16" x 1¾" Hammer Drive Anchor	5/16" x 1¾" Hammer Drive Anchor
Bridle Rings — 5/8" — At turns and intermediate attachments in runs of up to 5 wires.	(Note 3)	(Note 3)	Use Toggle Bridle Rings	In 1" x #10-14 Lead Screw Anchors	In 1" x #10-14 Lead Screw Anchors
Drive Rings — 5/8" — At turns and intermediate attachments in runs of up to 5 wires.	(Note 3)	(Note 3)	Use Toggle Bridle Rings	In ¼" x 1" Hammer Drive Anchors	In 1¼" x 1" Hammer Drive Anchors

Note 1 — When house construction includes soft fiber backing, make attachment to wood stud behind backing, wood trim, or eaves on building.

Note 2 — Standard brick veneer is 3¾" thick. On old brick veneer that cracks or crumbles on drilling, or on veneer thinner than 3¾" thick, make attachment to wood trim or building eaves, using "S" knob alone or on house bracket.

Note 3 — At stations with fuseless protection, metallic fixtures such as drop wire hooks, bridle rings, and drive rings may be employed where it is determined that drop wire insulation has adequate dielectric strength to omit porcelain knobs and tubes. A galvanized cable clamp of the proper size to fit the drop wire may be used at the final attachment of the drop, with 1" x #10 galvanized wood screw for frame building.

Note 4 — For four wires in medium or light loading zone, use two "T" knobs and ⅜" x 5" galvanized machine bolt. When 2 "S" or "T" knobs are assembled on bracket, place one knob above and one below the bracket.

to properly support the run should be placed. The attachments should be spaced approximately 9 feet apart in horizontal runs and 12 feet apart in vertical runs, unless it is necessary to adequately clear the building siding or to prevent the wire from striking the building in wind swept locations by placing the attachments closer together. The attachments should be evenly spaced between either end of the run and the turning point.

The wire in drop runs should be pulled up sufficiently tight to maintain a neat appearance of the run. The wire between the drop attachment on the building and the "C" knob associated with this attachment, however, should have a small amount of slack so that the

Please turn to page 42

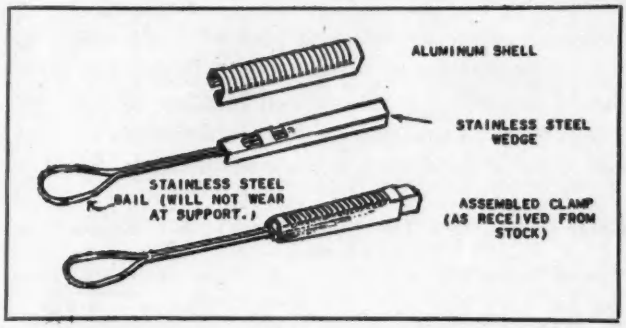

ALUMINUM SHELL
STAINLESS STEEL WEDGE
STAINLESS STEEL BAIL (WILL NOT WEAR AT SUPPORT.)
ASSEMBLED CLAMP (AS RECEIVED FROM STOCK)

FIG. 12: — Typical drop wire clamp assembly.

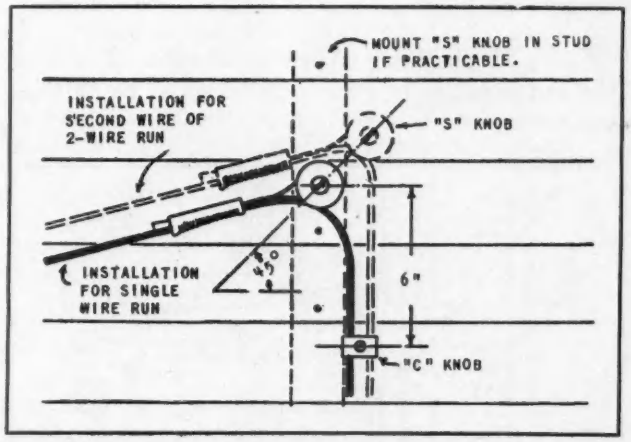

MOUNT "S" KNOB IN STUD IF PRACTICABLE.
INSTALLATION FOR SECOND WIRE OF 2-WIRE RUN
"S" KNOB
INSTALLATION FOR SINGLE WIRE RUN
6"
"C" KNOB

FIG. 13: — Primary attachment of drop span to frame building, when angle of drop with building is 30° or less, using "S" and "C" knobs for one or two wires in run.

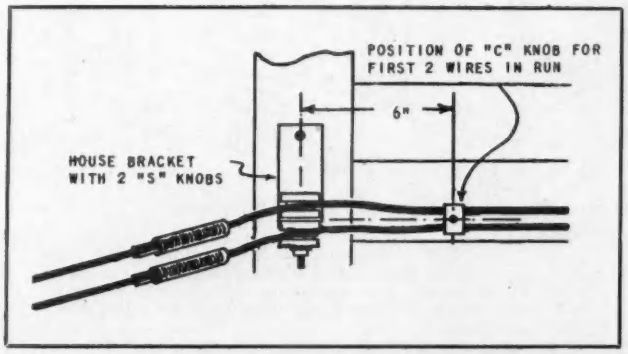


FIG. 14: — Primary attachment of drop span to frame building, using house bracket and one or two "S" knobs. An additional house bracket may be placed below the first one for additional wires.

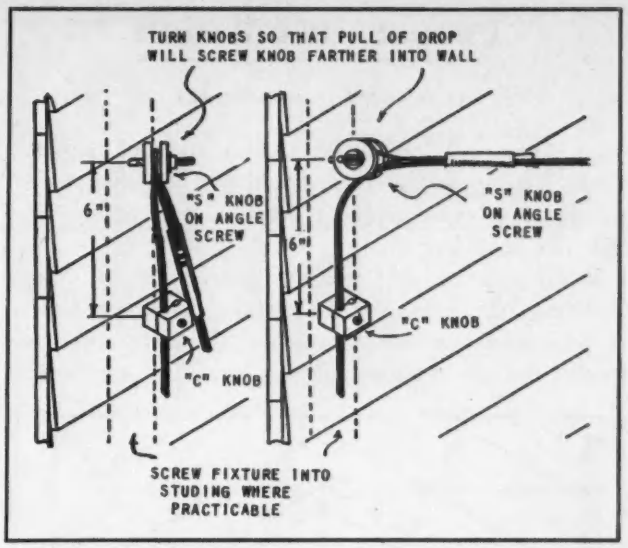

TURN KNOBS SO THAT PULL OF DROP WILL SCREW KNOB FARTHER INTO WALL
"S" KNOB ON ANGLE SCREW
6"
"C" KNOB
"S" KNOB ON ANGLE SCREW
6"
"C" KNOB
SCREW FIXTURE INTO STUDING WHERE PRACTICABLE

FIG. 15: — Use of angle screw with "S" knob for primary attachment of drop span when angle of drop with building is 30° or greater. A "C" knob is employed for the secondary attachment.

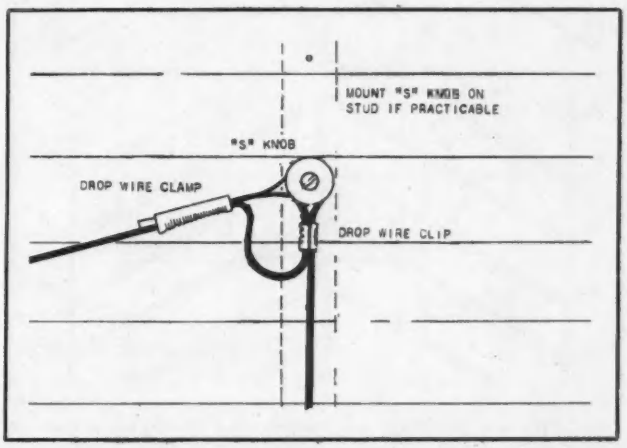


FIG. 16: — Drop wire clip used to attach drop wire run on building to same "S" knob with drop wire clamp for drop span. This arrangement eliminates the "C" knob used for the secondary attachment. The wire loop should be so placed in the knob groove that the clamp bail will not rub against it.

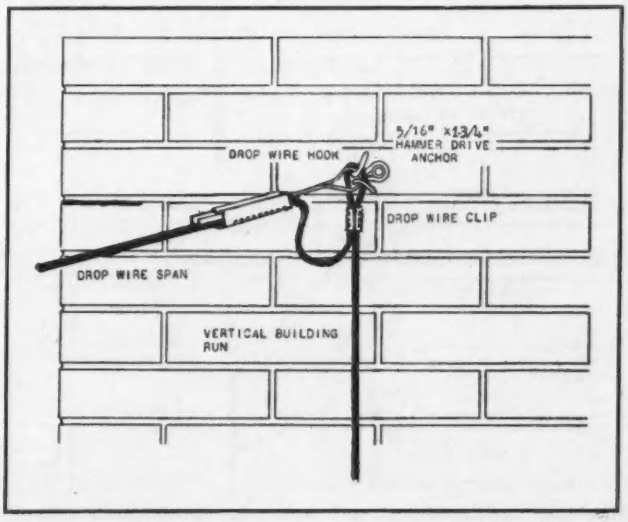


FIG. 17: — Use of drop wire hook and drop wire clip at primary attachment of drop wire span to brick building.

Proper Installation

(Continued from page 41)

drop clamp will take all the strain and not the "C" knob. Wire in bridle rings should not be pulled up so tightly as to cause rings at turns in runs to cut into the wire insulation.

When making the primary attachment on frame buildings, the screw for the fixture should go into a stud in the frame wall, if practical. Wall studs may be located by the presence of nail heads in the siding indicating where the siding is fastened to the studding.

To prevent splitting of the wood siding, guide holes should be drilled in the desired location for the fixture screws. Satisfactory guide hole diameters for various wood screw sizes are listed in the table below:

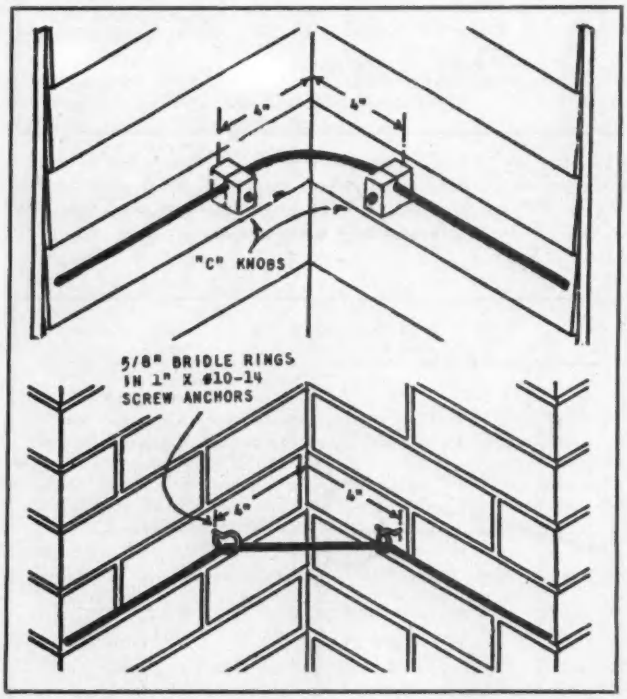


FIG. 18: — Methods of supporting drop wire run at inside corner turns. Top — on frame building. Bottom — on brick building.

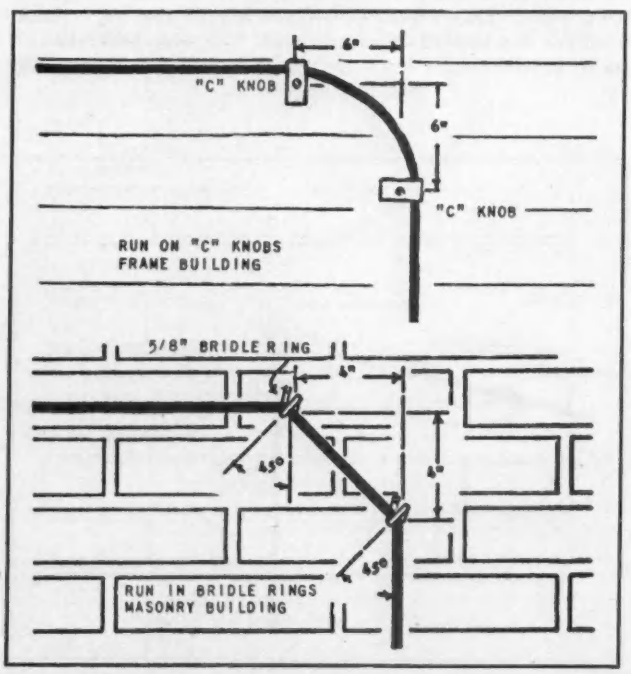


FIG. 19: — Methods of supporting drop wire run at turns from horizontal to vertical direction of run.

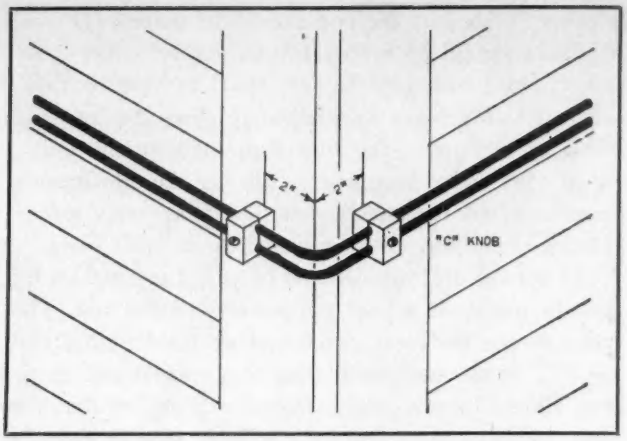
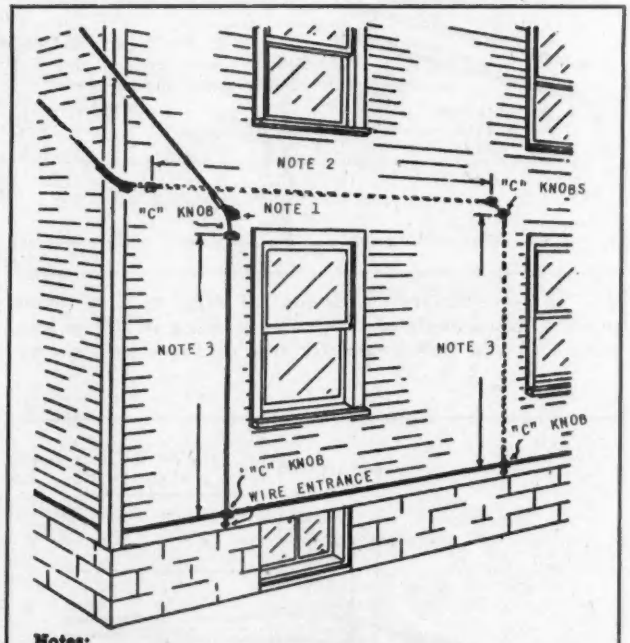


FIG. 20: Method of supporting drop wire run at outside corner turn.

Guide Hole Sizes for Wood Screws and Screw Type Fixtures

Size of Screw	Size of Drill
No. 10	3/32″
No. 14	1/8″
No. 18	11/64″
Angle Srew	11/64″
Insulated Screw Eye	3/32″

Figure 21 illustrates typical attachments of a drop span and wire run on a frame building. — *To Be Continued.*



Notes:

1. **Locate first attachment at this or other points on building to make direct vertical run (solid outline) to protector. Use horizontal run (dotted outline) only when necessary for drop span to avoid obstructions.**
2. **Place additional attachment if over 9 feet.**
3. **Place additional attachment if over 12 feet.**

FIG. 21: — Showing how drop wire is attached to building and lead to entrance with vertical or horizontal run.

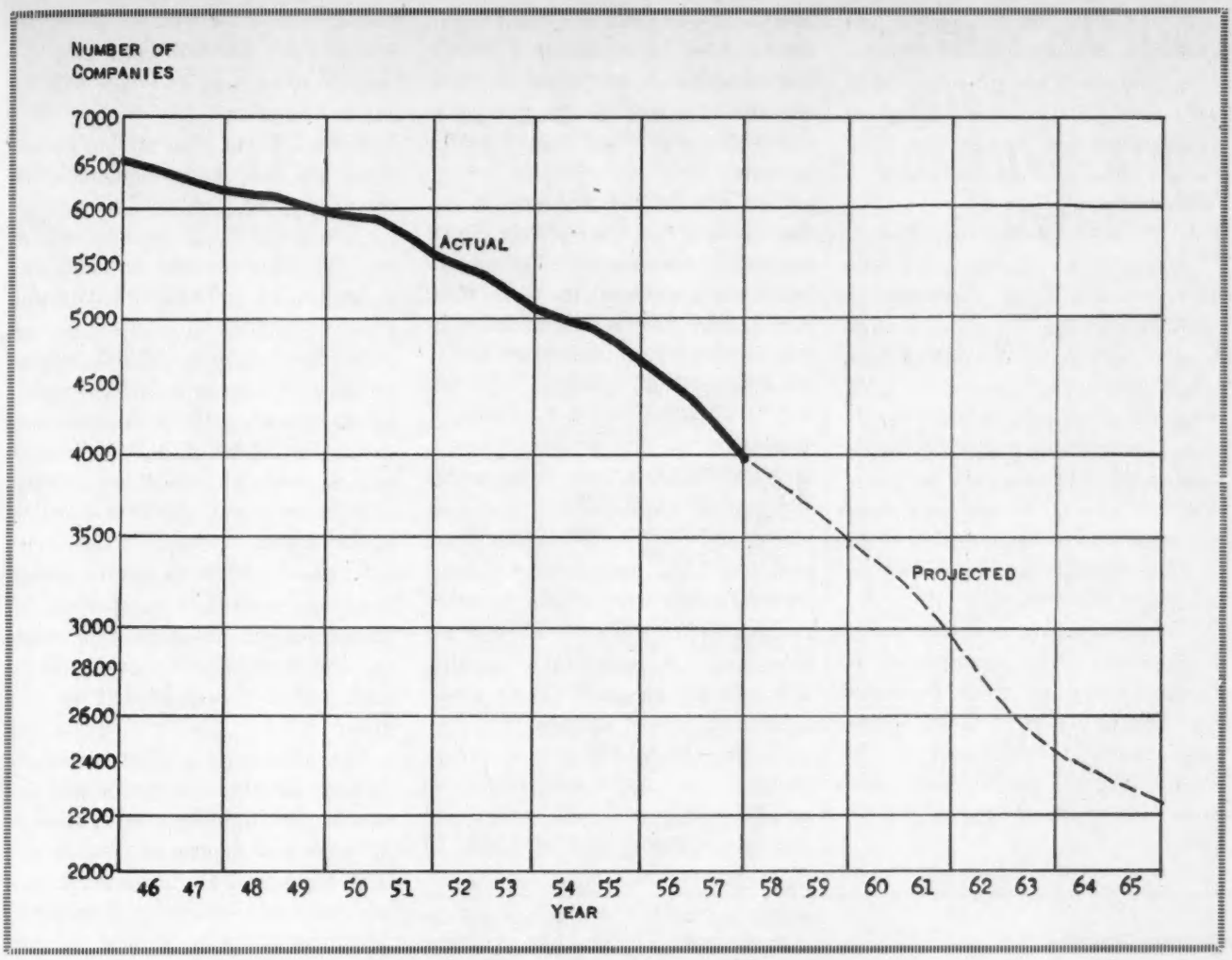


CHART ONE: — Independent Telephone Companies in the U. S. A.

"Shaping The Industry's Future"

By BILL CORMAN*

What's ahead for the owner of a 150-station company? Mr. Corman believes 75%, or 822 of the 1,102 existing companies operating 150 stations or less will be sold out to other companies by 1966, and 180 will grow into a larger classification.

DO YOU EVER take some interesting industry statistics and play around with them to see what will come out? It can be a most rewarding pastime and once in a while it gives you an idea.

You may remember that in a recent article (2/1/59 *issue of "Telephone Engineer & Management"*) I did a little prognosticating about what was going to happen to the telephone industry. Some of the conclusions arrived at in that article were as follows: —

After looking at these statistics it is obvious that something is happening — and a little thought will tell you many companies are being

Independent Telephone Companies	Number Now Operating (Jan. 1, 1958)	Expected Number of Companies on Dec. 31, 1966
With from 0 to 150 stations	1,102	100
With from 150 to 350 stations	1,074	200
With from 350 to 550 stations	530	400
With from 550 to 750 stations	277	250
With from 750 to 1,000 stations	229	275
With from 1,000 to 5,000 stations	600	800
With from 5,000 to 10,000 stations	66	78
With more than 10,000 stations	113	125

**Mr. Corman is manager, Southland Telephone Co., Atmore, Ala.*

absorbed by other companies and practically all companies are growing. Now, the fooling around with figures that I want to do involves finding out a little about those two factors.

"Absorptions"

LET'S TAKE the first one first. If you add up the totals of both columns you will find a decrease of 1,763 in total number of companies. In other words, in the period from Jan. 1, 1958 to the end of 1966, 1,763 Independent Companies may be absorbed by other companies. Of course, some of the companies will go out of existence and other new companies will come into being — but these are very minor considerations and we will forget about them.

The question now arises as to how to distribute these absorptions, or disappearances, or sales (whatever you want to call those 1,763 companies) among the different groups. After giving it some thought, I have come up with the following percentages:

Telephone Companies	Percent that will be absorbed	Number that will be absorbed
0 — 150	75% (Approx)	822
150 — 350	50%	537
350 — 550	35%	186
550 — 750	25%	69
750 — 1,000	20%	46
1,000 — 5,000	15%	90
5,000 — 10,000	10%	7
Over 10,000	5%	6

It doesn't seem necessary to go into all the reasons behind the above percentages. If you don't like the percentage figures I have used, you rearrange them to your own tastes. Any small rearrangements are not going to change the end result that I am getting at anyway.

To be perfectly clear, we are trying to say — of the 1,102 Independent companies now existing which have from 0 to 150 stations, I expect that 75% (or 822) will be sold out to other companies by the end of 1966. And so on down through each group.

If you will agree that my percentages are at least approximately right, we are ready for the next step. Subtracting the number of companies I expect to be sold from those now existing, we have what will be left in operation. The total comes out to the total number of companies I believe will be operating at the end of 1966, but the arrangement by groups is rather different from what I said I expected.

This difference is accounted for by the other big factor — *growth*. Small companies are going to grow into *mediums*, and mediums into *bigs*. And we are now at the point where I think you may get interested in this "fooling around" process.

Growth

LET'S TAKE a look at what this growth translates into for each size group. The 0 to 150 station group now has 1,102 companies. Of these, by 1966, 822 will be sold to other companies. 180 will grow into a larger class but still retain their identity. 100 will still be in this same group with their present identity.

In the 150 to 350 station group, there are now 1,074 companies. 180 smaller companies will grow into this group for a total of 1,254. Of these, 537 will be sold, 517 will grow into the next higher group, and 200 will still be in this group by the end of 1966.

In the 350 to 550 station group, there are now 530 companies. 517 companies will grow into this group, for a total of 1,047. Of these, 186 will be sold, 461 will grow into the next larger group, and 400 will be left in this group.

In the 550 to 750 station group, there are now 277 companies. 461 companies will grow into this group, making a total of 738. Of these, 69 will be sold, 419 will grow into the next larger group, and 250 will be left in this group.

In the 750 to 1,000 station group, there are now 229 companies. 419 companies will grow into this group, making a total of 648. Of these, 46 will be sold, 327 will grow into the next larger group, and 275 will be left in this group.

In the 1,000 to 5,000 station group, there are now 600 companies. 327 companies will grow into this group for a total of 927. Of these, 90 will be sold, 37 will grow into the next larger group, and 800 will be left in this group.

In the 5,000 to 10,000 station group, there are now 66 companies. 37 companies will grow into this group, for a total of 103. Of these, 7 will be sold, 18 will grow into the next larger group, and 78 will be left in this group.

In the over 10,000 station group, there are now 113 companies. 18 companies will grow into this group for a total of 131. Of these 6 will be sold, and 125 will be left in this group.

The interesting part of course, is picking out the size group you are now in, and figuring out the chances of what will happen to you in the next few years. For example, if you are in the smallest group, the chances are about 8 out of 11 that you will have sold your property by the end of 1966, and 3 out of 11 that you will have retained your company. And if you do retain it, the chances are about 2 out of 3 that you will have moved at least into the next higher group, and 1 out of 3 that you will still be under 150 stations.

If you are in this group, you may well be mumbling to yourself (and I truly hope you are), "I don't care what he says, I'm going to keep my company!" But if that is your position, these figures should still mean something pretty important to you. If you do intend to keep your company going, it is easy to see that the odds are 8 to 11 that you won't.

What makes those odds that way? There are many factors, the principal one being that a company with less than 150 stations just doesn't have enough gross revenue to pay all the things that have to be paid. So if this is where you are, and this is where you intend to stay, the main problem you have to solve is how to get your revenue up to where it will

support a telephone company. And Neighbor, as much as I like little companies, I'm willing to bet 8 to 11 that you can't do it.

The Odds Change

SO IF you agree with me, now take a look at some of the other groups. The 550 to 750 group for example. The odds are a lot different here. All told over the next 10 years, there will be 738 companies in this group, and only 69 will be sold. Instead of an 8 to 11 chance of having to sell out, the chances are now almost 11 to 1 that you can keep your company.

Does that give you an idea? If it doesn't, it should. You can add 400 or 500 stations to your company, either by feasible development of undeveloped territory, or by the reasonable purchase of other small companies, and thereby change your chances of survival from almost impossible to very, very probable.

If you are in some other group, the above will give you some idea of the sort of reasoning you can indulge in about your company. You may, for instance, be in one of the larger groups, say 5,000 to 10,000 stations.

In both your group and the groups around you, you will notice that there is at least some chance that you will sell your property. Maybe you want to of course, and if you do, it's your business and I hope you get a good price.

But, on the other hand, maybe you want to insure that your property won't be sold. In this case, what you have to do is discover why properties of your size are sold, and then set about offsetting those reasons.

One big reason many good telephone properties are sold is lack of continuity of management. The man or family owning or controlling the company dies off or gets interested in something else — and the company is sold. Providing for continuity of management may be difficult, but if you want to insure maintenance of control for yourself, or your family, or your group, whatever it may be, it must be done.

Another big reason good companies are sold is that the common stock gets out of control. No company where the man, or the family, or the group, does not have control of the common stock can insure itself against sale. In a very large company with widely spread common, such control is, of course, impossible, and in that case about all that can be done is to again fall back on the excellence of management — do such a good job that the stockholders will want no change.

Under certain circumstances even that may be well nigh impossible. Or you may be at that point where you have no choice except to sell so much common that you sell away your control. This sort of a situation always presents problems, but there may be ways around the problem. It may be possible to create a new company and sell some of your property to it so as to maintain control over your basic or core exchanges. An example of this would be something similar to what the Southwestern States Company did recently. (*See page* 41, 12/1/58 "*Telephone Engineer & Management*"). Preferred stock, if you haven't already used that road as far as it will go, might help.

EDITOR'S NOTE

We know some readers may disagree with Mr. Corman's forecast. Whether you agree or disagree we'd like to receive your thoughts on the subject. Just address your letter to TE&M.

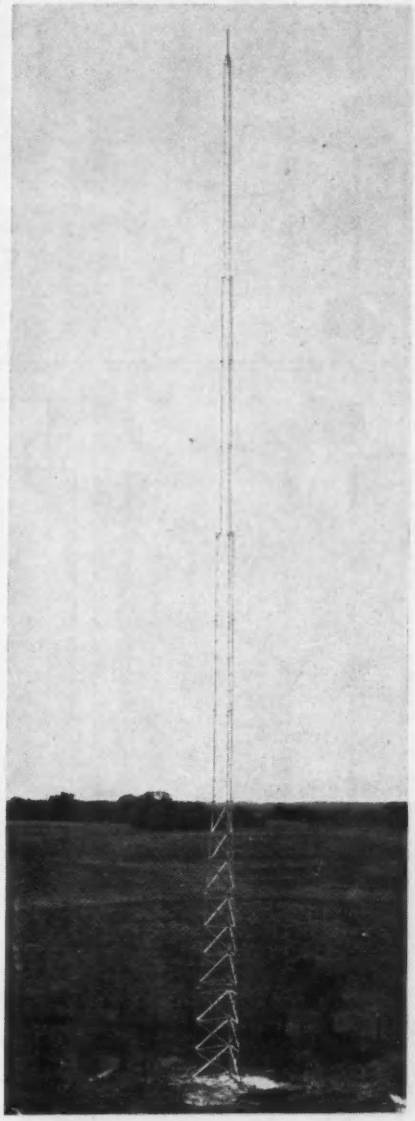
In other words, you may have exactly the opposite problem from the man with the 150 station company. He is too little — you may be too big (too big, that is, to be able to retain the control that you want to retain). It's not impossible — with so much capital, you can build only so big a company, so fast — and if you build bigger than that, or faster than that, you may well be losing common control.

Do you see my point, Neighbor? Whatever your size, it will probably pay you to "fool around" with these figures a little. It certainly won't hurt, and if you are like me, you'll find it quite a bit of fun. . . . I'd be pleased to receive your thoughts on this subject. Just send your letter to me in care of "Telephone Engineer & Management." — *Bill Corman.*

New ROHN

SELF SUPPORTING

COMMUNICATION TOWER



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TELEPHONE ENGINEER & MANAGEMENT'S

Electronics

NOTE BOOK

By LEO G. SANDS

Prepared for
Educational Division
TELEPHONE ENGINEER & MANAGEMENT
7720 Sheridan, Chicago 26,
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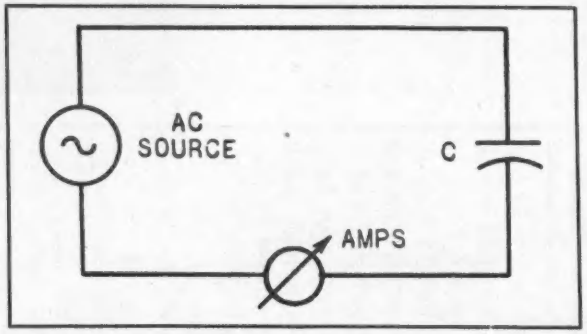
TELEPHONE ENGINEER & MANAGEMENT's
ELECTRONICS NOTEBOOK

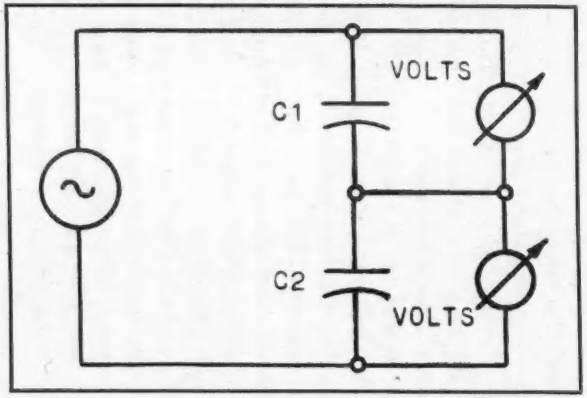
By LEO G. SANDS

2.2-9 — AC Across a Capacitor



When AC is applied to a capacitor, current flows through it. The higher the capacity and the higher the frequency, the greater the current.

2.2-10 — Capacitor Voltage Divider



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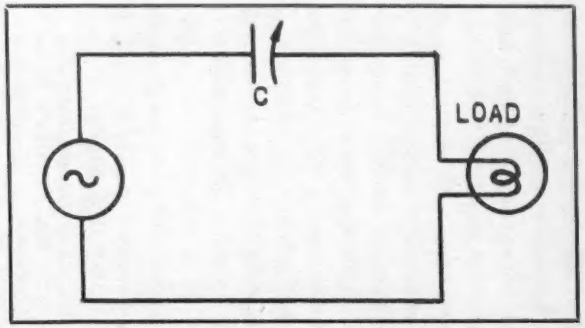
Capacitors C_1 and C_2 are in series. If they are of identical capacity, the voltage drop across each will be the same under no-load conditions or if each is shunted by the same value and kind of load.

2.2-11 — Capacitor Current Limiter



A variable capacitor in series with a load can be used for varying the current through the load. In actual practice, with commercially available variable capacitors, such a scheme would only be used at radio frequencies. This kind of circuit would be used, for instance, in the output of a radio transmitter, or between stages of a transmitter.

2.2-12 — Variable Voltage Divider

Two variable condensers in series, C_1 and C_2, form an adjustable voltage divider. This kind of arrangement is used in some very high frequency signal generators as an output attenuator. Either of the capacitors could be of fixed value, with the other

More Data For Your "Electronics Notebook" on Page 47.

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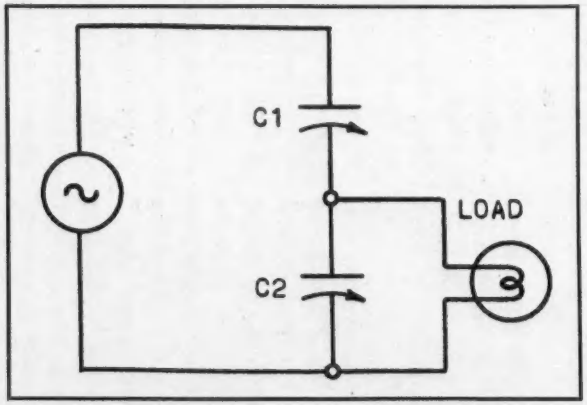
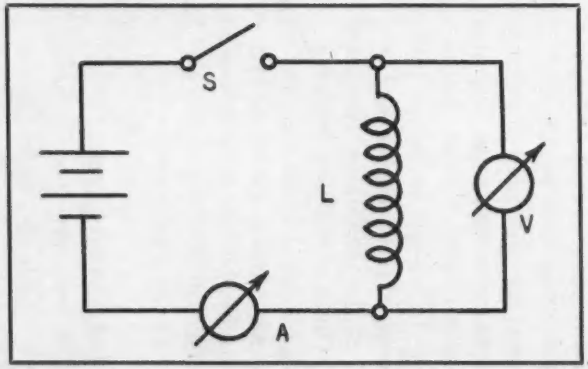


variable, since it is the capacity relationship that determines the ratio of voltage division.

2.3 L CIRCUITS

2.3-1 — DC Through An Inductance

When switch S is closed, the voltmeter will immediately indicate full battery voltage but the ammeter will show a gradual rise in current, reaching a steady state as determined by the resistance of the inductor. When switch S is opened, the collapse of the magnetic field of the coil will cause a sharp kick of voltage across the coil, even with battery disconnected.



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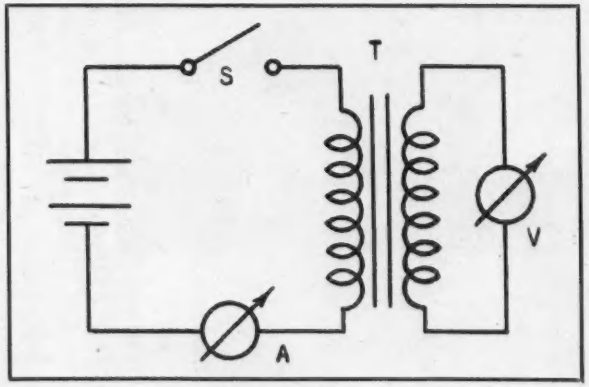
ELECTRONICS NOTEBOOK

By LEO G. SANDS

2.3-2 — DC Through a Transformer

When switch S is closed, the ammeter will show a gradual rise in current before it reaches a steady state. The voltmeter will read zero. However, when S is opened an inductive kick of higher voltage than the original battery voltage will be indicated by the voltmeter.



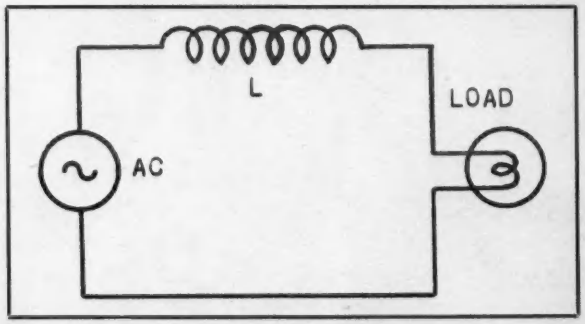
2.3-3 — Current Limiting

In an AC circuit, an inductor (L) in series with a resistive load will act as a resistor, limiting current flow as determined by its reactance and its resistance. If DC were applied instead, only the resistance of the coil would have any affect on current flow.

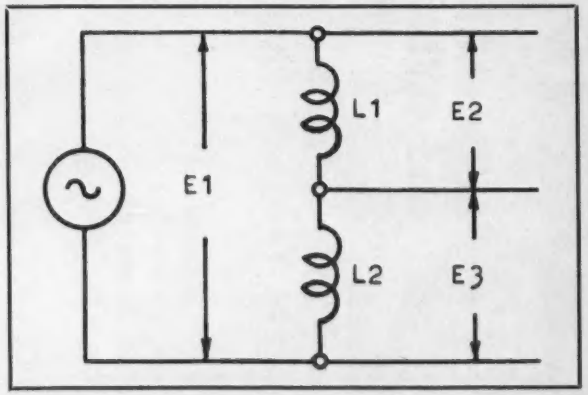
TELEPHONE ENGINEER & MANAGEMENT's

ELECTRONICS NOTEBOOK

By LEO G. SANDS

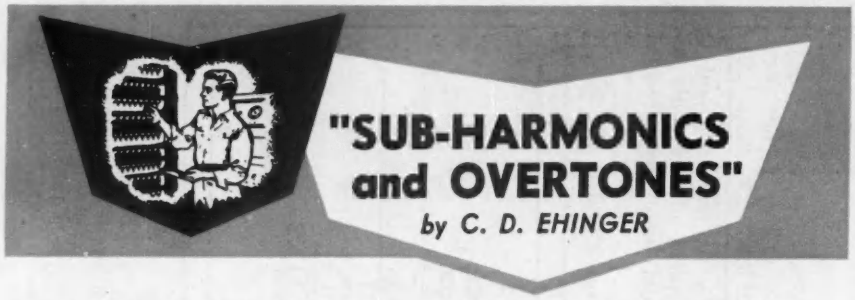


2.3-4 — Voltage Divider



Inductors L_1 and L_2 form an AC voltage divider. If of equal value E_2 and E_3 will be equal under no load conditions.

More Data For Your "Electronics Notebook" in the Next Issue.



"The Right Voltmeter For The Job"

THE KID had a case of trouble on a carrier circuit. He figured one of the tubes wasn't biased correctly and he went to work with a meter he thought would do the job, stopping only when Jim asked "What's the ohms-per-volt rating of your meter?"

JIM REMOVED his heavy topcoat and carefully placed it on a hanger in his locker in the locker section of the Centerville exchange equipment room. His hands were numb from the biting cold and he rubbed them together briskly. It had taken him nearly three hours to drive to each of the CDO offices serviced out of the Centerville exchange.

This had been one of the unscheduled inspection trips he attempted to make at least once a month to each office which was a part of his responsibilities. Although some of the boys sometimes grumbled about it, Jim had a fetish for cleanliness and orderliness in any telephone equipment room and had long felt the grade of service being supplied could be fairly well judged by the degree of neatness, completeness, and freedom from dust and dirt in the equipment room.

While walking over to his desk, Jim followed his usual habit of checking to see where everyone was. Things seemed to be fairly normal: Larry was using the tea-cart to routine the first selector shelves, Naomi was at one end of the mainframe, running jumpers, Chet and Bill were finishing their cabling job for the new connector shelves, Chuck was at the test bench margining relays on a connector switch, and Jim could see the Kid over by the carrier rack.

A Garbled Circuit

SOMETHING about the Kid's stance, or attitude, seemed to imply some kind of trouble. Jim decided he had probably better check with the Kid before returning to his desk.

The Author, C. D. EHINGER is president of Citizens Tel. Co., Decatur, Ind.

"Hi, Kid, — everything going all right?"

"I think so, Jim," the Kid replied. "Fact is, I think I've run down a case of trouble but I don't know exactly what to do about it."

"What's the deal?"

"Well, Laura, the Chief Operator, reported our Metro No. 9 circuit was in trouble and it has been turned down at the testboard. It's a carrier circuit. Chuck didn't have time to come over and work on it right now but he gave me the schematic of the carrier and told me to see what I could do about it until he has time to come over and help me."

"What kind of trouble was reported, Kid?"

"The trouble ticket says that it is 'garbled'. I plugged in on the monitor jacks at the testboard and it sure does sound 'horsed up,' and Jim, I think I've found the trouble right now! First thing I thought of was that we're getting distortion and I've just been studying some of that business to get ready for my test for my Novice Amateur-Radio ticket."

"What trouble have you found?" Jim asked.

"Well, I figured one of the tubes wasn't biased correctly, since we're getting distortion, so I got out the voltage check charts and the first point I checked is way off."

Ohms Per Volt Rating

JIM LOOKED at the schematic and the voltage check-charts carried in the manual for the carrier equipment. The Kid had placed the manual, a volt meter, and some test-prods on the portable equipment test bench the Centerville exchange used in the equipment room.

"Show me what you've done and what you've found, Kid," Jim said.

"Well, you see the very first point which they tell us to check in the voltage check points — it is point 8 of this tube socket and the voltage chart says that I should read 1-volt between point 8 and the ground, and I only get ½ of a volt. According to the schematic, this is the cathode of the tube and — seems to me that shows that the tube certainly isn't biased correctly."

Jim picked up the volt meter the Kid had been using. "Hey, Kid, where did this volt meter come from? It certainly isn't one of ours."

"Oh — forgot to tell you, Jim. Since I'm fooling around with amateur radio, I bought myself a VOM meter and just finished calibrating it against our precision job that we have here. Thought I'd use it in running down this trouble in the carrier."

Jim sighed, picked up the volt meter, the carrier manual, and said: "Come over to my desk with me, Kid, I want to show you something."

The two walked over to Jim's desk and sat down while Jim pulled out paper and pencil. "Now, Kid, your new VOM is a mighty handy instru-

DON'T GET ME WRONG...I STILL DON'T LIKE STORMS

**"But they don't seem to hit us so hard any more.
Not since polyethylene coated wire came along."**

The lineman's boss also gives polyethylene credit for reducing outages during storms. This tough plastic forms a continuous shield that resists moisture, weathering and aging. It protects the conductor from contact with wind-whipped branches and wires, prevents short circuiting by chance electrical contacts.

Protection is long-lasting. Early installations have shown no deterioration after 11 years exposure to all sorts of weather. And accelerated aging tests point to an expected life as great as 40 years.

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- Tree wire covering
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- Control cable insulation and jacket
- Corrosion protection for metal sheaths
- TV Lead Wire

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ment. It's portable, handy to use, and well worth the money you paid for it. But, let's get something straight — what is the ohms per volt rating of your meter?"

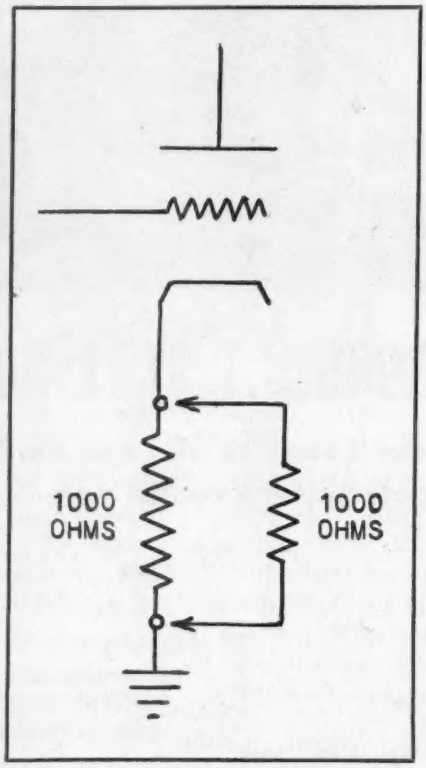
The Kid looked at the meter face. "Well, it says here that it is 1,000 ohms per volt."

"That means when you are on the 1-volt range the total resistance that the meter presents is 1,000 ohms. When you're on the 100-volt range, the total resistance of the meter is 100,000 ohms; etc. — do you get that?"

"Yes, I didn't pay any attention to that part of it."

"No, I know you didn't. That is just why I want to explain to you why you *do* have to pay attention to it."

Jim rapidly drew a sketch on the paper.



"The cathode resistor of this tube is 1,000 ohms. If I connect two 1000-ohm resistors in parallel, what is the combined resistance?"

The Kid glanced at Jim. "Uh — 500 ohms."

"That's correct. You were on the 1-volt range of your VOM, which meant you were placing 1,000 ohms across a 1,000-ohm resistor. With this set-up, your meter was actually loading the circuit down to the point where you had a 500-ohm resistor as the bias resistor, and consequently, if no other part of the circuit was affected by this change, you would only read one-half the voltage which you could normally expect."

"For gosh sakes! I see it now, but I hadn't thought of it before."

"You must never forget, Kid, that measuring instruments must be used intelligently in order to get intelligent results. Don't ever discount the effect of the instrument on the circuit you are measuring. As a matter of course, always try to get a measuring instrument with at least one-hundred times the impedance of the point you are measuring. If it can be a higher ratio than that, so much the better — which is exactly the reason why we have so many vacuum tube volt meters around here whose input impedance is around 11 megohms."

The Kid walked slowly back toward the carrier racks and was joined by Chuck who would help him learn that carriers sometimes do drift off frequency. — *C. D. Ehinger* (73).

Any comments, criticisms, or suggested subjects as a future topic? Address all mail to: "Sub-Harmonics and Overtones," "Telephone Engineer & Management," 7720 N. Sheridan Rd., Chicago 26, Ill.

EDITOR'S NOTE

In the next issue of TE&M (Mar. 1), Mr. Ehinger will discuss "Satellites and the Telephone Industry." Other subjects scheduled for Mr. Ehinger's TE&M department include:

(1) "The 'Q' of a Coil and Figure of Merit for Condensers."

(2) "Sleet Storm Insurance For The Telephone Plant."

(3) "The 'Kid' Is Thrown By Eddy Currents."

(4) "The 'Fletcher Munson' Effect."

COMMERCIAL DEPARTMENT NOTES

by ALLAN R. STACEY

"Selling The Non-User"

Increasing the saturation by selling service to non-users permits higher fill of existing cable or wire leads. This means the new subscriber requires less plant investment than those already connected to the system.

AT A TELEPHONE convention last year we were sitting around the usual small table doing the usual thing when one of my telephone operating friends said, "These campaigns to sell extensions are all right but I think we should be out selling primary telephones to premises that don't have any telephone service at all." The fellow on his right responded, "I have enough problems filling subscriber demand without going looking for trouble." During the subsequent discussion we came up with several reasons for conducting a non-user canvass.

The author, ALLAN R. STACEY, is vice-president of the Sunland-Tujunga Tel. Co., Sunland, Calif.

Why Start It?

FIRST OFF, it is our responsibility to give complete communication service within the territory we serve. Secondly, each subscriber added to the system increases the value of the service to the already existing subscribers because they are able to reach more people within their own community. Third, and here is the reason I like best, if the plant has been properly planned very little additional investment is required to serve the non-user premises along existing leads.

More Revenue With Little Investment

INCREASING the saturation by selling service to non-users permits higher fill of existing cable or wire leads and means that this new subscriber requires less plant investment than those already connected to the system. If the outside plant has adequate margins no additions are required and the heavier cable fill results in a higher profit mark-up.

Mechanics Of The Canvass

SUBSEQUENT to our round-table discussion one of the men conducted a non-user canvass and carried it on in this way. He assigned one man to the project in a medium size exchange. From the assignment department was obtained a list of all of the addresses where telephone service was currently being provided in the area selected for canvass. Equipped with list, a knowledge of rates and two or three forms the salesman started out. At each house he checked the street address and if he found it on his list he knew that active service was provided there and proceeded until he found a premise that was not on his list. Here was a prospect.

He knocked upon the door and if the occupant displayed some interest in telephone service the salesman proceeded to attempt his sale. No effort was made to "high presure" persons who were definitely not interested because of the belief that if they were persuaded to take the service it would not stay in.

Different Approach

THE SALESMAN'S approach was somewhat different to that of the commercial service representative in the business office because here he was trying to make a sale with someone who had displayed so little interest that he or she had made no attempt to contact the telephone company. In contrast the commercial representative is usually working with someone who already has a desire. Accordingly, the outside salesman usually quoted the lowest possible charge for installation of the service rather than using the so-called "package selling" technique which produces higher revenue per customer in the business office.

If the prospect turned out to be warm but not hot, meaning that he indicated some desire for telephone service but was not ready to put his name on the dotted line, the salesman left a form indicating rates and a line for signature so that sevice could be ordered through the mail. Further, he left a postcard which could be forwarded to the business office to request another personal contact by the outside salesman.

The Canvass Results

SUMMARIZED in Table I are the results of the non-user canvass. Out of a total of 1,930 residences 1,708 were found to have active service. This left 222 without telephones. With an 88% saturation like this you might think there would be little potential for additional service sales.

Out of the 222 non-users it was found that 29 houses were unoccu-

Please turn to page 54

Type 85 Teleph

PROVIDE TWO-LINE PICKUP, SI

EXTENSION EXCLUSION
Pressing first button cuts off all extensions on Line 1. Pressing second button brings extensions back on the line (extensions are automatically restored when handset is replaced).
TYPE 85-C
TWO-LINE PICKUP
Turning this button connects telephone to a second line. By pressing this button, user can signal his secretary with a light or buzzer.
OPERATOR

ephones

UP, SIGNALING AND EXTENSION EXCLUSION

Here's a wonderful convenience for small commercial subscribers. We call it the Type 85-C Telephone (shown at left).

With this instrument, your subscriber has access to two outside lines. He can exclude all extensions. He can signal his secretary. He can do all these things with the versatile Type 85-C telephone—at the flick of a button.

The Type 85-C telephone fills a special need for many subscribers in your area. Doctors, attorneys, insurance offices, real estate agencies (and you'll think of many more) are all potential customers. They'll want the convenience, efficiency and privacy that the Type 85-C provides.

Subscribers will like the classic beauty of Type 85-C. It's identical with our famed Type 80. Has all the regular Type 80 features, too—including 10 attractive colors.

We'll be happy to tell you more about the versatile Type 85-C Telephone. Just write: *Automatic Electric Sales Corporation, Northlake, Ill. Or call Fillmore 5-7111.*

OTHER MODELS OF THE TYPE 85 TELEPHONE

TYPE 85-A. Has combined push-and-turn button only, for 2-line pickup and signaling. Can be wired, on the job, for these other arrangements: single-line ringer cut-off, single-line extension switching, single-line extension switching with ringer transfer, external ringer control, and extension exclusion with line shorting.

TYPE 85-B. Has pushbuttons only, for extension exclusion. Can be wired, on the job, for 2-line pickup.

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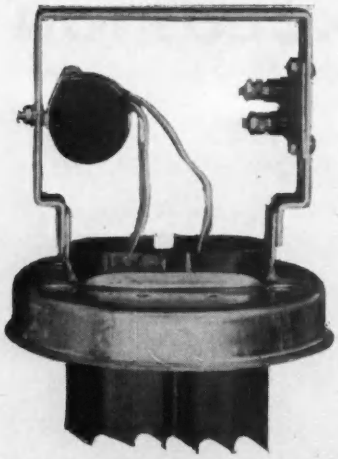

LUG—3 TERMINAL WITH ONE PAIR TERMINAL ASSEMBLY AND ONE C152-1 LOADING COIL

★ **PEDESTALS** — TWO PIECE SIX FEET LONG

★ **POLE BRACKETS**—AVAILABLE FOR AERIAL MOUNTING

★ **LOADING** — LOAD ONE OR MORE PAIRS AS REQUIRED USING TYPE C152 READY MOUNT ASSEMBLIES

★ **NON-PROTECTED TERMINALS** — CP16 ASSEMBLIES AVAILABLE IN ONE, TWO, SIX, TWELVE AND SIXTEEN PAIR COMBINATIONS

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★ **ACCESSIBLE** — FOR TESTING, CABLE OR WIRE SPLICING, CROSS CONNECTING AND SUBSCRIBER DISTRIBUTION

★ **ECONOMICAL** — BUY ONLY WHAT YOU NEED—ADD LATER

★ **STRONG** — ALL GALVANIZED STEEL CONSTRUCTION

CATALOGUE NUMBER	DESCRIPTION	CAPACITY	WIRE & CABLE
LUG-3	TERMINAL PEDESTAL ASSEMBLY AND 8" HOOD NO TERMINAL STRIPS, NO COILS	TERMINALS	LOADING
		ONE, TWO AND SIX PAIR	ONE TO THREE PAIR

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pied, 100 householders were not at home and only 93 could be contacted.

In the 93 personal interviews 12 orders for telephone service were taken. This represented a 13% successful sale of those interviewed.

The gross revenue increase from these twelve subscribers was $85.00 in non-recurring service connection charges and $159.00 in the first three month's exchange rental. This meant a gross first three month's revenue of $244.00.

TABLE ONE

Summary Of Sales Canvass Of Residential Premises Without Telephone Service

1. Total Residences	1,930
2. Less: Premises with Telephone Service	1,708
3. Total Non-Users	222
RESULTS OF CONTACTING NON-USERS	
4. House Unoccupied	29
5. Householders Not At Home	100
6. Householders Contacted	93
7. Orders Taken for Telephone Service	12
GROSS REVENUE INCREASE	
8. Service Connection Charges	$ 85.00
9. Three-Months' Exchange Rental	159.00
Total First Three Months' Revenue	$244.00
COST OF SOLICITATION	
10. Total Manhours	64
11. Direct Labor Cost @ $3.75 per hour	$240.00

Cost Of The Canvass

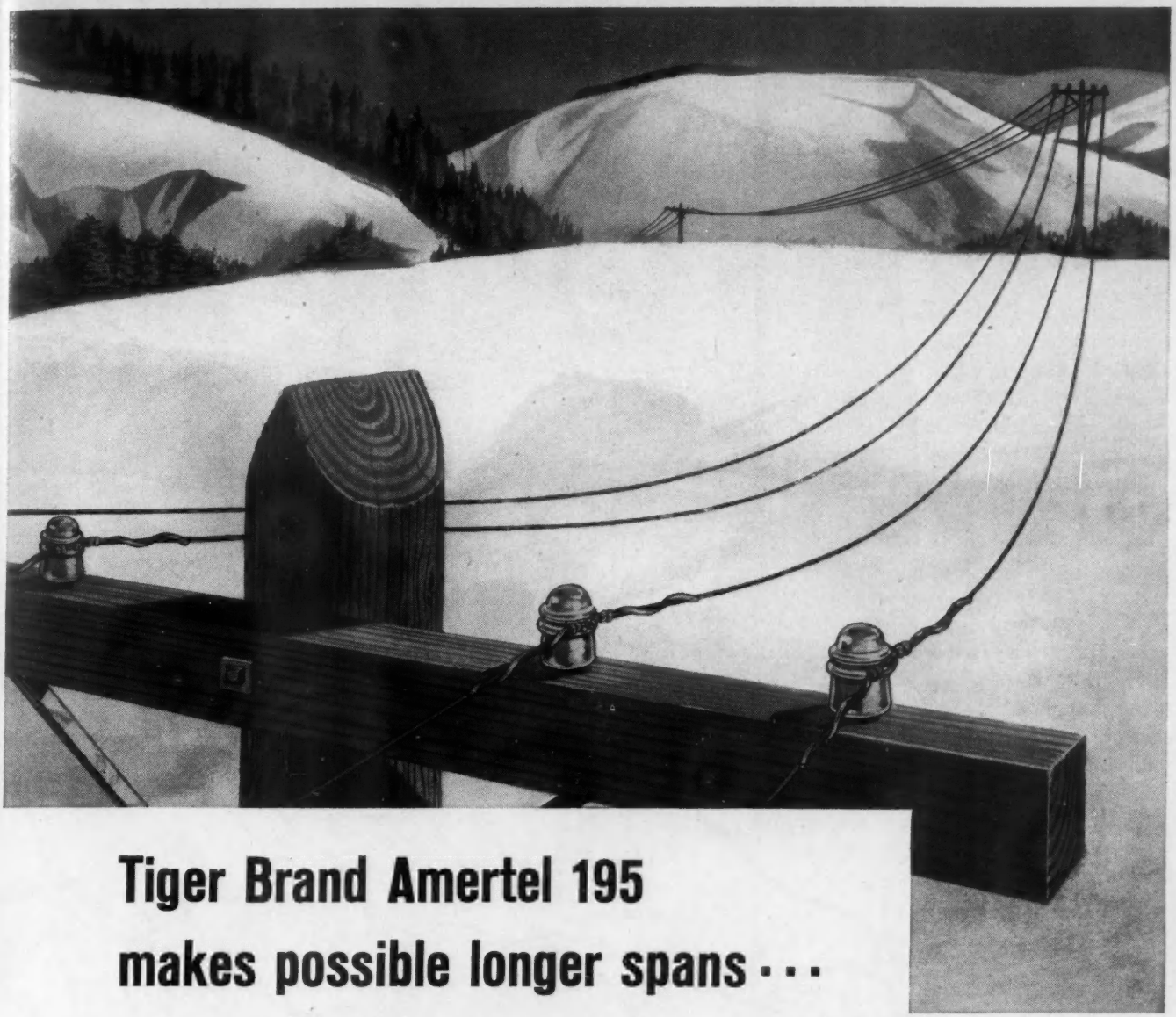
THE CANVASS required 64 manhours and priced out at $3.75 per hour produced a direct labor cost of $240.00. You can see then that the first three month's revenue from these services covered the direct labor cost of the canvass. And this was without consideration for toll revenue generated by 12 additional services.

The Variables

WAS THIS campaign typical of what you might expect in your exchange? This was a tract development situation where the salesman was able to walk from house to house and accordingly travel time was low. In a less densely populated situation the travel time would be higher.

The income level for this commun-

Please turn to page 57



Tiger Brand Amertel 195 makes possible longer spans . . .

better rural telephone service—improved voice transmission efficiency

USS Amertel 195—thanks to improved physical and electrical properties—offers a voice transmission efficiency greater than other galvanized steel telephone wire. Amertel's lower resistivity at higher frequencies makes significant improvements in voice transmission quality.

With USS Amertel 195, rural telephone lines can now be strung with spans up to 700 feet in Light Loading areas; to 650 feet in Medium Loading areas; and to 600 feet in Heavy Loading areas. These longer spans result in reduced material and installation costs per mile of line, make it possible to expand rural telephone service faster and to extend service to remote areas where installation costs had previously been prohibitive.

The longer spans made possible with Amertel can easily bridge rivers and gullies. They can match the spans of rural power lines, eliminating the need for intermediate supporting poles. In areas where icing is a problem, the greater strength of USS Amertel permits the wire to stretch under ice load, yet return to its original stringing position after thawing.

More information available free! To find out more about USS Amertel 195—just write for a free copy of our booklet, Amertel 195. American Steel and Wire, 614 Superior Ave., N.W., Cleveland 13, Ohio. In it you'll also find complete information on USS Amerstrand Guy Wire.

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Inside Sales, Rochester

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ity was about average for the county. However, different results might be obtained where the income was either higher or lower.

The time for each interview may be lengthened at the desire of the salesman or he might give up sooner on contacts that display little interest.

An Interesting Question

I WONDERED why these particular customers that signed up for service didn't voluntarily come to the telephone business office. Several reasons were given. They were unable to come to the business office during the hours it was normally open because both husband and wife worked all day long. They did not realize that it was possible to arrange for telephone service without bodily coming to the business office.

Another reason given was that they just couldn't afford it. Here a good sales talk would persuade the customer of the value of the telephone service. And the third reason was that they "just didn't have a need." Again a good sales talk should demonstrate the real need for telephone service today.

The Future

PERSONALLY, I am quite enthused about the idea of a non-user canvass provided that the salesman can bring in sufficient new business to justify the direct cost of putting him in the field. It appears to me that if you can recover the labor charges within the first three months of revenue a canvass like this is certainly worthwhile.

In the next issue we'll discuss the perplexing problem of how far to extend customer credit. See you then.
—*Allan R. Stacey.*

SUBMIT YOUR PROBLEMS

You are invited . . . to tell Mr. Stacey about your problem of commercial department policy or procedure on which you'd like to have an opinion.

While we don't claim to have all the answers, we'll welcome the opportunity to discuss as many as possible in this column . . . and that could be helpful to you and others with the same (or equal) problem.

The Editors.

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The name Klein on leather goods is known and preferred by linemen and electricians everywhere. Klein tool belts, safety straps, pouches and pockets represent the highest in quality, the safest in design and construction.

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ACCOUNTING NOTES

by G. M. JONES

Establishing Usable Sets of Ratios

REQUIREMENTS for service to be performed by the operating unit should be related to various costs resulting from providing services. Here's how to find easily usable sets of ratios that have direct bearing on a particular department's needs.

Establishing Ratios

I HAVE indicated that requirements for service to be performed by the operating unit should be related to various costs resulting from providing services. How does one go about it to find simple, easily usable sets of ratios that have direct bearing on a particular department's needs? After a ratio is established, how reliable is it in making periodic estimates of expenses?

One of the simplest approaches is a simple scatter diagram of pairs of factors. On one axis is plotted number of units of service performed, on the other axis some particular cost element connected with doing the job. For example, assume an imaginary 4-man department which is charged with the installation and repair of Tix. A Tix is an imaginary gadget that is used with every extension telephone.

The department has other duties, but some of its time is taken up with installing and repairing Tix. As the use of extension telephones grows over the coming year, the installation and repair requirements for Tix will grow. The immediate problem is to determine next year's manpower requirements for this one activity (and, therefore, its cost).

The time required for a particular Tix installation varies considerably, depending on location of the instrument, distance to the job, skill of the installer-repairman, and so on. *Figure One* is plotted from the imaginary observed data of *Table One*, containing monthly information over the

TABLE ONE
Historical Volume and Cost Data
September 1957 through August 1958

End of Month	Stations in Service	Extension Tel's	Number of Work Orders Inst	Number of Work Orders Rep	Hours Used Inst	Hours Used Rep	Materials Tix	Materials Other	Vehicle Charges
S	4,700	235	14	3	42	5	$ 56	$ 4	$ 85
O	4,724	240	5	5	11	5	24	8	62
N	4,729	258	18	3	31	4	76	12	84
D	4,736	276	18	7	37	6	80	20	114
J	4,756	288	12	6	34	9	52	7	82
F	4,760	304	16	4	40	8	64	16	86
M	4,800	324	20	6	41	7	88	20	94
A	4,842	348	24	6	60	8	104	26	116
M	4,874	385	37	2	83	3	148	4	138
J	4,934	440	55	8	118	8	236	13	226
J	5,016	460	20	9	52	13	88	19	112
A	5,080	510	50	9	122	10	212	14	214
Totals	57,951	4,068	289	68	671	86	1,228	163	1,413

Average extension telephones per main station	.0702
Average number of repair orders per month per extension	.017
Average hours required per installation	2.32
Average hours required per repair order	1.27
Average repair materials per repair order	$2.40
Average vehicle charges per service order	$3.96

Gaffs and leg irons are forged high quality, medium carbon steel, heat treated to assure proper balance of hardness, toughness, ductility.

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A climber's first consideration in a pair of hooks is just how safely, how comfortably do they anchor his feet in the pole. M-S-A–Brooks adjustable linemen's climbers give him the security he's looking for. And a lot more to boot.

Here's why. First off, these are the only climbers made with a tang extending from the gaff. This tang curves under the foot and for safety's sake fastens positively at both sides of the foot. No amount of climbing will work the gaffs loose from the leg iron. But *a man can unfasten them in a jiffy* for maintenance or replacement in the field.

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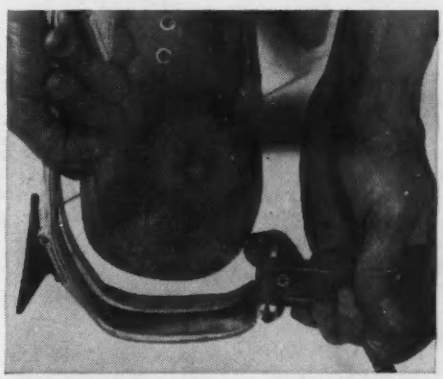
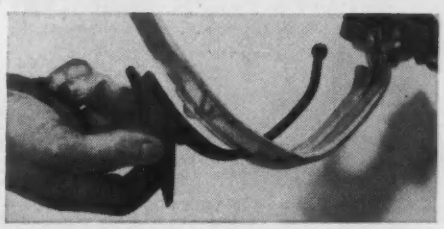
The MSA man has the entire story. Ask him for details. Or write us for helpful literature.

*Meets E.E.I. specifications.





Gaff and tang fit through slot in leg iron, are seated in channel of stirrup and locked in on both sides of the foot for utmost safety.

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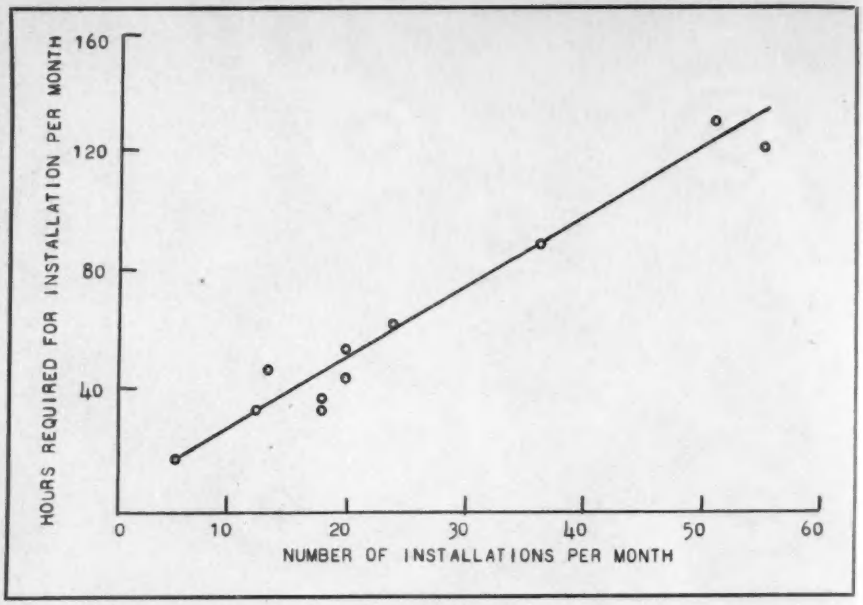


FIGURE ONE.

past 12 months. There are several questions to which we want answers:

(1) *What is the average time for a new Tix installation?*

(2) *What is the average time for a Tix repair job?*

(3) *What is the average vehicle charge on a Tix installation or repair?*

(4) *What is the cost of materials on a repair job?*

(5) *What is the pattern of the incidence of repair orders in relation to the number of extension telephones outstanding?*

(6) *Is there any seasonality in repair?*

(7) *What is the growth pattern in extension telephones?*

(8) *Is there a wide or narrow variation in average times or average costs?*

Figure One contains only one set of pairs of data: on the x-axis we have plotted the number of installations in a month, on the y-axis the number of hours reported that month in making installations. We find here a very simple, very reliable relationship. There are no time-consuming calculations; we can read directly from the scale to obtain an estimate of the manpower hours needed for Tix installations for any month in which any given number of installations is stated.

It would be possible merely to relate column totals to one another and obtain a basic relationship for estimating purposes. This has been done at the foot of *Table One*. For the relationship between number of installations and hours needed, a straight-line assumption is indicated.

The advantage of beginning with scatter diagrams for pairs of cost factors is that they require no technical skill, are simple to plot, and are a quick way of showing whether the pattern of relationship is simple or complex.

Many of these scatter diagrams do not fall in a straight-line pattern, and a straight line drawn through the center of the group of dots does not describe the relationship so precisely as we have done in *Figure One*. In such a case, we must not attribute too much preciseness to estimates made directly from such a line. If the amount involved is material, a simple ratio may not be sufficient; the least squares method of regression analysis (found in any elementary statistics textbook) will give an equation describing the relationship and also a "standard error of estimate" which indicates reasonably well how closely actual figures for any given month are likely to be to the estimate that is obtained by using the equation.

Such time-consuming refinements as the least squares method are not necessary to begin with, however. It is more important to get prompt, workable crude figures than tardy exactitudes. Keep the ratios as simple to work with as you can.

TABLE TWO
Selected Ratios for the Data of Table 1

Month	Ave. Hrs. per inst.	Ave. Hrs. per rep.	Ave. vehicle chg. per service order
S	3.0	1.7	$5.00
O	2.2	1.0	6.20
N	1.6	1.3	4.00
D	2.1	.9	4.48
J	2.8	1.5	4.55
F	2.5	2.0	4.30
M	2.5	2.0	4.30
A	2.5	1.3	3.86
M	2.2	1.5	3.54
J	2.1	1.0	3.59
J	2.6	1.4	3.86
A	2.4	1.1	3.63

If there is any element of seasonality in the averages, its extent may be seen quickly by calculating the ratios of pairs of factors by months, as in *Table Two*.

There is no indication here of seasonality in the average time required to install or repair Tix, but another trend appears that is significant for projecting installation costs: a gradually decreasing vehicle charge per service order. Where a definite trend like this occurs, it is reasonable to use the average of recent months as the best estimate for the future; therefore, in projecting the department's costs for Tix work, we will apply the last six months' average vehicle charge (instead of the full year's average) to the number of expected service orders in any month of the coming budget period.

Maine PUC Rules On Tax Depreciation Question

● Commission claims company is not using "tax-saving" method; reduces proposed rate hike by amount commission could be saved by use of "accelerated depreciation."

A RATE increase plan proposed by the Bangor Hydro-Electric Co. was rejected in a 2-to-1 majority decision by the Maine State Public Utilities Commission, which said it would approve a lesser boost.

The commission said the firm is not using a "tax saving" method available to the company. Its decree reduced the proposed boost in net income by the amount the commission said could be saved for the rate payers by this means, $85,000 in the test year.

Observers believed that this element of the case — involving use of "accelerated depreciation" in computing federal income tax — was a new step for a regulatory commission anywhere in the nation.

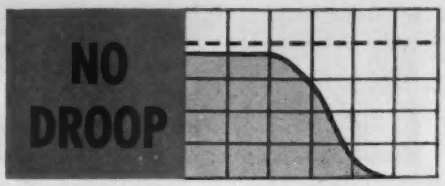
Commissioner Frederick N. Allen, who is now chairman of the agency, dissented from the majority decree. He said he did not think the commission has a right to force upon the firm, "either by direction or indirection," the choice of one of several options available under the Internal Revenue Code.

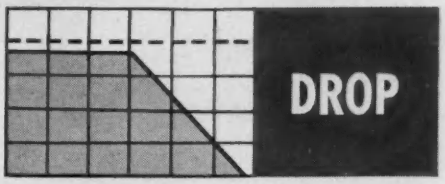
Allen said it was "unwise for this commission, at this time, to enter openly into an area which is perogative of management and management alone."

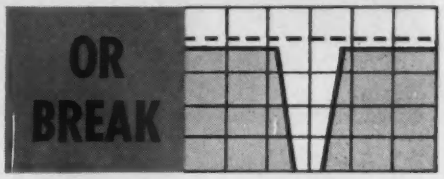
The commission accepted a rate base of $29,645,000 and the only expense item questioned was federal income tax.

"We find," the commission said, "that the failure of the company to use accelerated depreciation in the test year in computing its income tax expense constitutes an abuse of discretion which would place an unfair burden upon its customers."

Accelerated depreciation, it continued, should be used for rate-making purposes even though the firm "elects to pay a higher tax than it is liable for." The majority rejected the company's contention that such a ruling would place an unfair burden on future rate payers.







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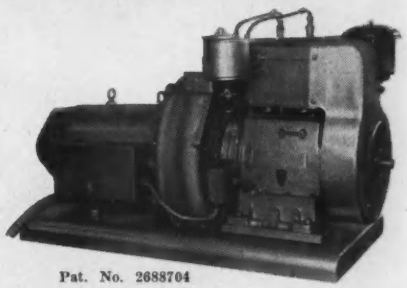

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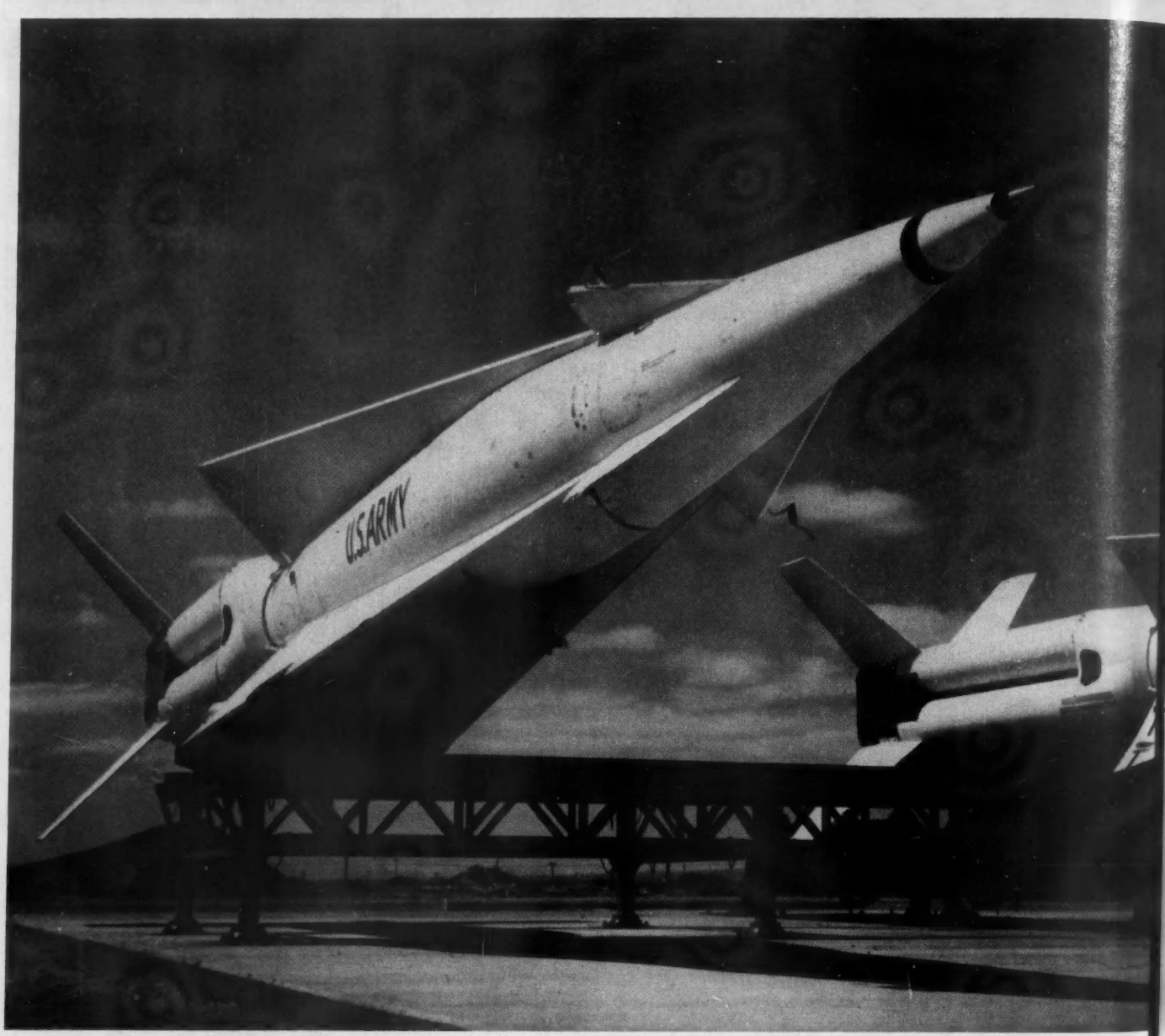
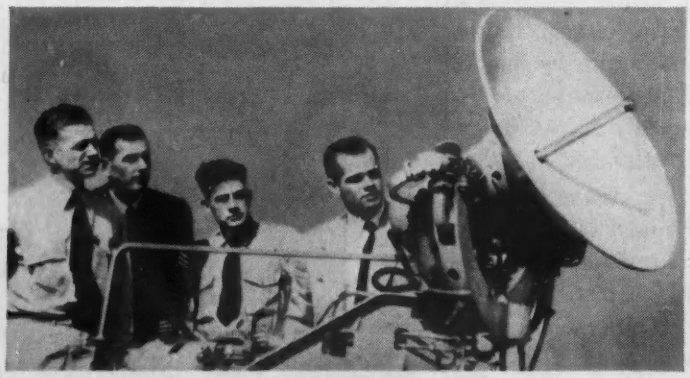


NEW NIKE guided missile, the U.S. Army's Nike Hercules, is now going into service alongside the earlier Ajax at Nike sites near key U.S. cities. Guidance equipment for Nike systems is made at W.E.'s North Carolina plants.



THE MEN of Western Electric's Field Engineering Force instruct and advise the Armed Forces on W.E.-made equipment that helps direct guns, bombs and missiles for the Army, Navy and Air Force.

DEW LINE of radar stations, built by W.E. for the Air Force in 32 months, is now being extended across the Aleutians. Hundreds of Bell System people bucked the Arctic to help build it.

NATIONAL DEFENSE

From the DEW Line in the Arctic to the Nike Systems here at home, Western Electric's telephone experience has been put to work in the nation's defense.

Telephone work may seem a far cry from the building of the DEW Line or production of the Nike guided missile systems. Yet, Western Electric was asked to handle these and other important defense assignments precisely because of the special capabilities it developed as manufacturing and supply unit of the Bell Telephone System.

Our being asked to produce the Nike and Terrier guidance systems—plus radar systems for guns, bombs, planes and ships—stems from Western Electric's experience as a manufacturer of telephone communications equipment. Because of the close integration of our efforts with those of Bell Laboratories and the Bell operating telephone companies, we've developed an ability to turn ideas swiftly and smoothly into working realities.

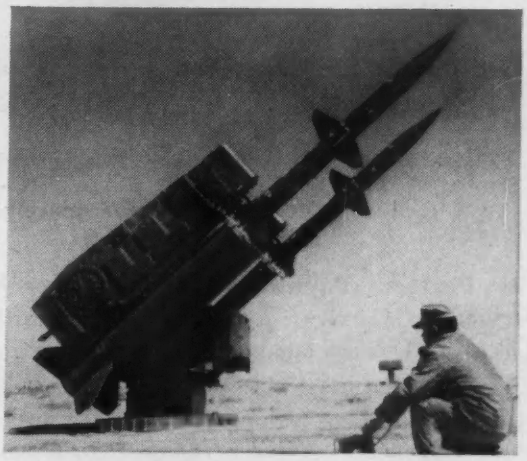
Our being asked to build the DEW Line and provide management services for SAGE – gargantuan problems in logistics – becomes understandable in light of Western Electric's supply job for the Bell System: marshalling men and materials, coordinating the activities of thousands of suppliers, to provide the things needed for telephone service.

In short, Western Electric's experience in handling vast projects of great technical complexity – plus its ability to bridge the gap between research and operation—presents a ready-made package of know-how useful to the government.

We are glad that our Bell telephone work has so equipped Western Electric to serve the nation's defense.

Western Electric

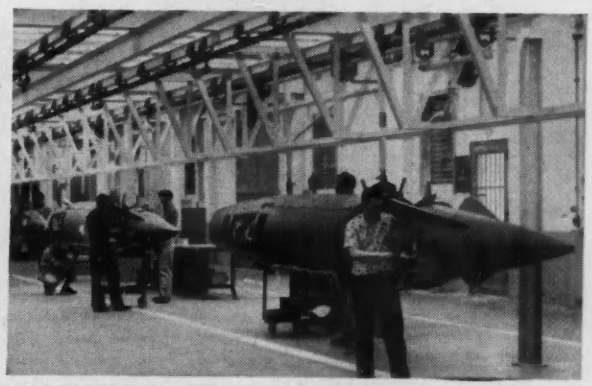
MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM



TERRIER. As prime contractor for the ground guidance equipment of the Marines' Terrier – a mobile guided missile system – Western Electric helps provide anti-aircraft protection on beachheads.

DOLLAR-A-YEAR JOB. At the request of the Atomic Energy Commission, Western Electric manages the Sandia Laboratories in Albuquerque, New Mexico. Mission: to help bridge the gap between research and production of complex atomic weapons.

SAGE NERVE CENTER. Western Electric is responsible for management services during the building of the Air Force's vital SAGE project, which is making the nation's air defense semi-automatic.



NATIONWIDE TEAM of 5,900 companies, part of W.E.'s supplier force of 37,000, helps with defense work. Among them Douglas Aircraft, maker of Nike air frame.

PLANT NOTES ON NEW DEVELOPMENTS

by JOHN S. REED

In this issue Mr. Reed discusses: (1) Subscriber's carrier equipment that provides post-payment paystation service on carrier circuits; (2) compression bonding for transistors and semi-conductors; and (3) a new, low cost emergency road marker.

Post Payment Paystation Service on Carrier

PLANT MEN are familiar with the type of dial pay telephones commonly employed to provide service in small communities. A coin is deposited after the calling party answers, rather than before as in the case of "pre-pay" telephones in large exchanges. The control equipment in the post payment paystation is arranged to short out the transmitter when the calling party answers and the user cannot converse with the party until he deposits a coin to remove the transmitter short.

The transmitter shorting operation is brought about by reversal of the central office battery on the line when the calling party answers. This current reversal feature is not practical on standard types of subscriber carrier systems, hence paystation service cannot be rendered on circuits derived from the carrier channels in these systems. Only the physical circuit can be employed for this purpose.

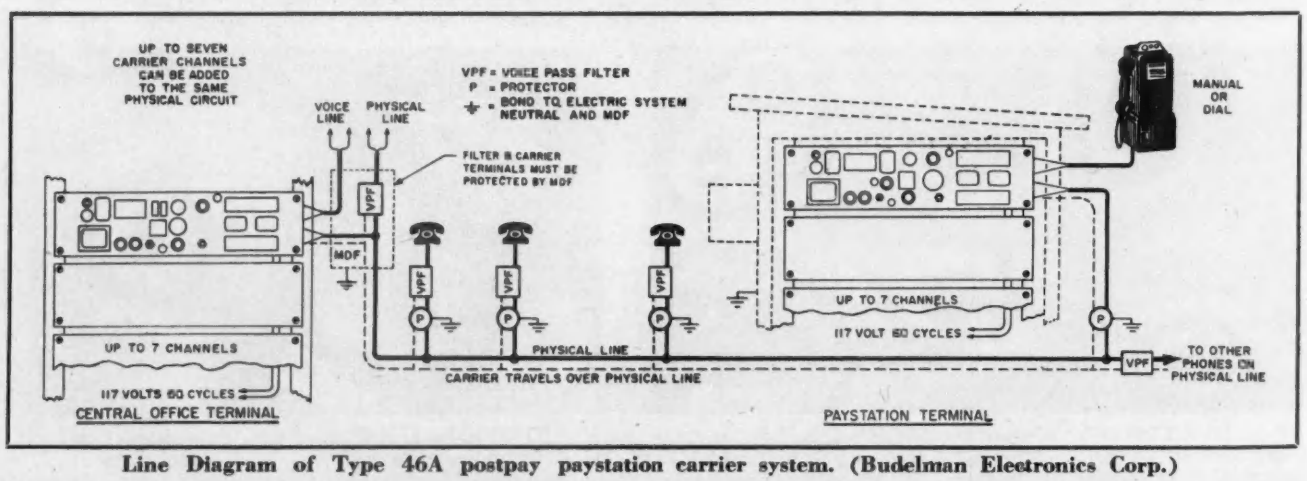
The Budelman Electronics Corp. has overcome this limitation in the first subscriber's carrier equipment specifically designed to provide postpay paystation service on circuits derived from the carrier channels. The equipment, designated as Type 46A, is a practical, low priced short-haul carrier designed to provide additional high quality postpay paystation service over existing exchange telephone lines without the necessity of running additional cable or open-wire physical lines, and without impairing or interfering with existing exchange service. It is considered more economical to use this postpay paystation carrier to provide a new paystation service beyond a six-mile radius of the central office than to provide additional plant.

Under special conditions, such as postponing cable plant expansion where spare cable pairs are not available, the use of this equipment is said to be economical within the urban area. The equipment can be recovered for use elsewhere in a few hours and is, therefore, considered ideally suited for highway paystation use since it is impossible to forecast roadside paystation revenues and flexible equipment is required for location changes to obtain optimum paystation revenue and profits.

The carrier equipment is of the double side-band amplitude-modulation transmission type arranged for easy installation and immediate operation. Servicing by telephone personnel is said to be simple and easy.

The illustration shows a line diagram of the Type 46A carrier telephone system. This equipment is a complete assembly, less standard external protective units, designed to provide one private line post pay paystation per channel. As many as seven additional channels, (paystations) may be operated over the same circuit, each channel providing a separate and complete new postpay paystation circuit. No external talking battery, coin collection equipment, or ringing equipment is required beyond that incorporated in each paystation carrier channel.

Basically, the voice drop of the paystation terminal can be considered as an extension of the paystation switchboard line circuit terminals from the central office main distributing frame. The carrier terminal equipment provides a non-interfering electronic extension of the existing telephone facilities furnishing all postpay paysta-


UP TO SEVEN CARRIER CHANNELS CAN BE ADDED TO THE SAME PHYSICAL CIRCUIT
VPF = VOICE PASS FILTER
P = PROTECTOR
⏚ = BOND TO ELECTRIC SYSTEM NEUTRAL AND MDF
VOICE LINE
PHYSICAL LINE
FILTER & CARRIER TERMINALS MUST BE PROTECTED BY MDF
MDF
VPF
P
UP TO 7 CHANNELS
117 VOLTS 60 CYCLES
CENTRAL OFFICE TERMINAL
PHYSICAL LINE
CARRIER TRAVELS OVER PHYSICAL LINE
MANUAL OR DIAL
UP TO 7 CHANNELS
117 VOLT 60 CYCLES
TO OTHER PHONES ON PHYSICAL LINE
PAYSTATION TERMINAL

Line Diagram of Type 46A postpay paystation carrier system. (Budelman Electronics Corp.)

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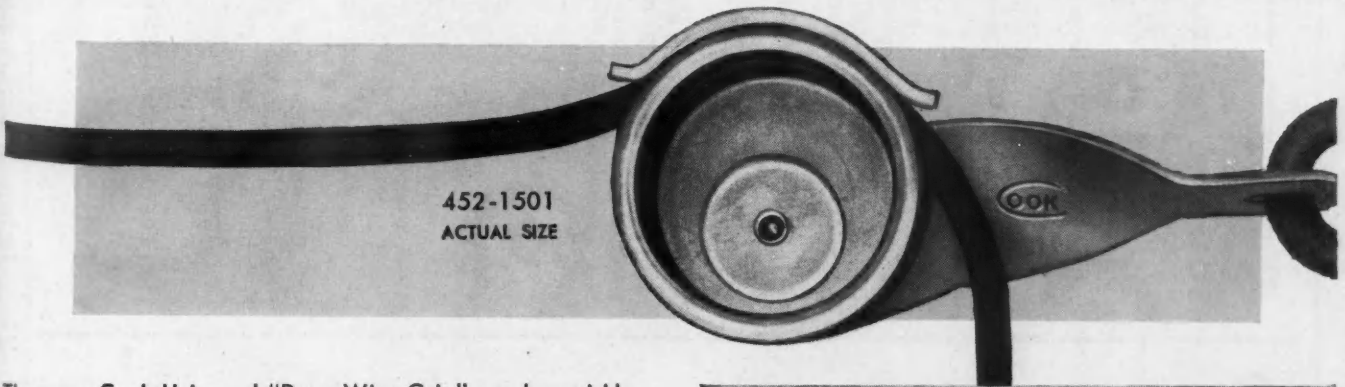

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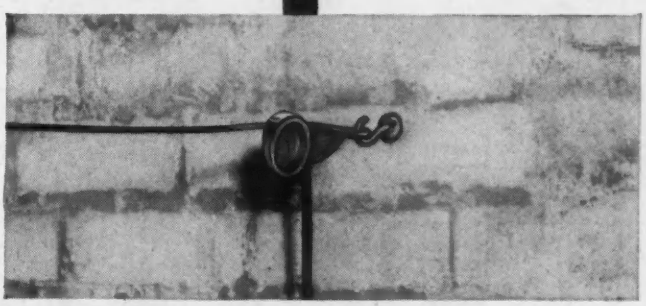

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"SPEC" BOOK

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(1) Materials and Tools for 2-Ton Line Construction and Tender Trucks

The following lists materials and tools carried on 2-ton telephone line construction trucks equipped with pole derrick and digger unit. Also listed are tools and materials carried in a tender or auxiliary truck (1/2-ton pickup). The two vehicles carry five men and work together. While the line truck is setting poles with two men, the lighter truck is dispatched to other parts of the lead for dropping off the other men to line up and tamp in the poles. After the line wires are strung from reels on the line truck or trailer and sagged, the tender truck is employed to take men back to the starting point for tying in the line wires.

The lists for the two trucks are typical of a middle western independent telephone company. There will be some variations in quantities and kinds of materials carried in trucks of other companies. The design of the trucks will also vary and it will be necessary to adjust the lists to fit the bin and drawer arrangements in the trucks used by a particular telephone company.

LEFT SIDE OF LINE CONSTRUCTION TRUCK

Compartment "A"

Bin #1	Tie wires, #109 iron	25 lbs.
Bin #2	Cable supports, aerial (all sizes)	
Bin #3	Bolts, 8" machine	4
	Bolts, 10" machine	6
Bin #4	Bolts, 12" machine	12
Bin #5	Bolts, 14" machine	6
	Bolts, 14" double arming	4

(2) Materials and Tools for 2-Ton Line Construction and Tender Trucks

Bin #6	Insulators, exchange	15
	Insulators, toll	4
Bin #7	Pins, insulator	6
	Cobs, transposition	5
Bin #8	Clamps, suspension	4
Bin #9	Washers, square 2 1/4"—11/16" hole	150
Bin #10	Screws, 1/2" x 4 1/2" drive	10

Compartment "B"

Bin #1	Bolts, 16" machine	3
	Bolts, 18" machine	3
	Bolts, 16" double arming	4
	Bolts, 18" double arming	4
Bin #2	Bolts, thimble eye, and S straps	8 each
	Tie wires, #104 copper	25 lbs.
Bin #3	Clamps, 3-bolt guy and Strandvises	20
Bin #4	Pins, deadend bracket and 1 1/4" round washer, 9/16" hole	20 each
	Nuts, 5/8"	8
Bin #5	Brackets, dead end	20
Bin #6	Bolts, 3/8" x 6" carriage	20
	Nuts, thimble eye	6
	Thimble eyes, angle	2
Bin #7	Bolts, 3/8" x 8" carriage	10
Bin #8	Bolts, 3/8" x 10" carriage	10
	Washers, curved	8
Bin #9	Bolts, 3/8" x 12" carriage	6
Bin #10	Insulators, deadend (spool)	20
Bin #11	Brackets, oak pole	20

More Data For Your "SPEC BOOK" on Page 67.

More Data For Your "SPEC BOOK" on Page 67.

TELEPHONE ENGINEER & MANAGEMENT'S

PLANT MAN'S 'SPEC' BOOK

(3) Materials and Tools for 2-Ton Line Construction and Tender Trucks

Compartment "C"

	Grips, messenger (small)	1
	Ratchet hoist (large)	1
	Ratchet hoist (small)	1
	Cutter, bolt	1
	Axes, chopping	2

Compartment "D"

Truck chains
Grease guns
Driver tool kit
Flare kits

RIGHT SIDE OF LINE CONSTRUCTION TRUCK

Compartment "A" (on hooks)

Sets lineman tools – belt, safety strap and climbers–3

Compartment "B"

Bin #1	Ratchet brace	2
	Tape line – 100'	1
	Small hand tools	
	Slitters, drop wire	2
	Sleeve pressing tool	2
	Pliers, long nose	2
	Wrench, angle screw	2
	Wrench, monkey	1
	Wrench, vise grip	1
Bin #2	Bolts, 1/2" x 4 1/2" machine	10
Bin #3	Nails, 50-D	30
	Nails, 30-D	30
Bin #4	Roll – sheet lead	1
	Guards, 3/4" cable	6
	Guards, 1" cable	6

TELEPHONE ENGINEER & MANAGEMENT'S

PLANT MAN'S 'SPEC' BOOK

(4) Materials and Tools for 2-Ton Line Construction and Tender Trucks

Bin #5	Tape, friction, rolls	2
	Tape, Polyethylene, rolls	2
	Wire polishers, copper	25
	Wire polishers, steel	25
Bin #6	Clamps, drop wire	25
Bin #7	Clamps, "C" lashing wire	15
Bin #8	Hammers, Lineman's	3
	Hammer, claw	1
	Wrench, lag	3
	Bit extension	2
	Screwdrivers, knob	2
Bin #9	Rings 1 1/4" bridle	16
Bin #10	Rings, 5/8" bridle	40
Bin #11	Clamp, 1/2" ground rod	6
	Connectors for #6 ground wire	6
Bin #12	Servi-sleeves for 2200-lb. strand	10
Bin #13	Servi-sleeves for 6000-lb. strand	10
Bin #14	Screws, 1/4" x 2" drive	15
Bin #15	Knobs, "S"	5
	Screws, angle	5
Bin #16	Knobs, "C"	10
	Screws, 2" x #10 wood	10
Bin #17	Staples, 1 1/2" guy	1/2 lb.
Bin #18	Nails, 6-D	1/2 lb.
Bin #19	Bolts, 3/8" x 4 1/2" carriage	30
Bin #20	Rings, 5/8" drive	50
Bin #21	Sleeves, 91-102D deadend	100
	Sleeves, T1-102x064D tap	25

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PLANT MAN'S 'SPEC' BOOK

(5) Materials and Tools for 2-Ton Line Construction and Tender Trucks

Bin #22	Sleeves, 5-109D190 straight	10
	Sleeves, 2-091D straight	100
Bin #23	Sleeves, 92-109D deadend	150
Bin #24	Sleeves, 1-102D straight	100
Bin #25	Sleeves, 2-102D straight	200
Bin #26	Sleeves, T2109x064D tap	100
Bin #27	Sleeves, T2109x045D tap	100
Bin #28	Sleeves, T2109D tap	50

Compartment "C"

Bin #1	Strand links, 5/16"	2
	Strand links, 3/8"	2
	Strand links, reducing 3/8" to 5/16"	2
	Strand links, 7/16"	1
Bin #2	Butt block, wood	1
	Plate and lag screw, step	1
Bin #3	Clamp, Type B span	2
	Clamps, Type C span	12
Bin #4	Steps, iron pole	12
Bin #5	Clamps, crossover	2
Bin #6	Clamps, 1-bolt	12
Bin #7	Marking nail kit	1
	Test sets, common battery	2
	Test set, dial hand	1
	Test set, magneto with inductive fault finder coil	1

PLANT MAN's 'SPEC' BOOK

The new "Plant Man's 'Spec' Book" will appear in each issue of "Telephone Engineer & Management." We urge all readers to read and file these informative 'Spec' book sheets for future reference.

More Data For Your "SPEC BOOK" in the Next Issue.

tion telephone service features by means of carrier frequency currents applied to an existing exchange telephone line.

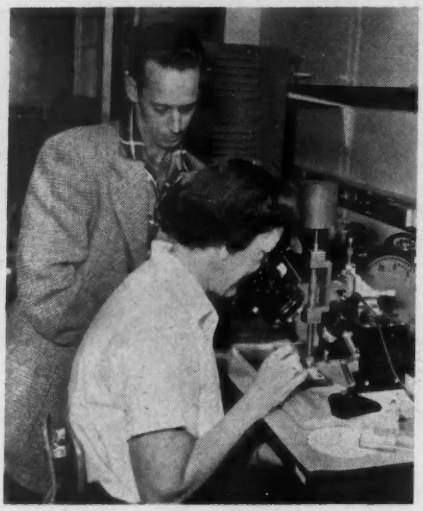
Information is provided for proper protection of the equipment from lightning and power disturbances. It should be noted that the carrier equipment is intended to operate only on central office equipment designed to provide postpayment pay telephone service. It is not intended for use with prepayment paystations which operate on a different kind of circuit arrangement.

Compression Bonding For Transistors & Semiconductors

COMPRESSION bonding of leads to the metallized germanium surfaces of high frequency transistors, recently developed at Bell Telephone Laboratories, provides a lead structure which can withstand 100,000g in a centrifuge and very high shocks. A combination of heat and pressure is employed to form the bond, without damage to the semiconductor. When properly formed, bonds made in this fashion can be stronger than the lead itself.

This bonding process is highly satisfactory where very small leads (0.0004″ in diameter) must be attached to small areas (0.001 inch by 0.006 inch), as in high-frequency transistors. The areas are previously treated with evaporated and alloyed metallic films from 1500 to 3000 angstroms thick (one angstrom being equal to .000,000,004 inch). Annealed gold has been found to be satisfactory as lead material.

COMPRESSION bonding of gold leads to a high-frequency transistor is being carried out by T. B. Light of Bell Telephone Laboratories.



H. L. MELLOR, Bell Telephone Laboratories, watches as Miss Joyce Hoffmann attaches a headed lead to a diffused silicon diode by the thermocompression bonding method.

The procedure is shown in the accompanying illustration. To form the bond, the wire is pressed on the desired area with a tool shaped as a half cylinder. A force sufficient to produce about an 85% deformation of the wire is employed. The temperature is held within the annealing range of the lead material (about 300°C for gold) during the process, and the bond is formed in a non-oxidizing atmosphere. Under these conditions, a bond can be formed in a second or two which is stronger than the lead material itself.

Other recent developments in thermocompression bonding have made it possible to form large area contacts between metallic leads and semi-conductor devices. It is also now possible to attach leads to opposite sides of a semi-conductor wafer simultaneously, thus making both base and emitter contacts at once.

For large area contacts, gold or silver leads from 6 to 15 mils in diameter are "headed" like nails. Heads are commonly 30 mils in diameter. These headed leads are fitted into a hollow jig in a ram, and pressed against the surface of the heated semiconductor.

Wires with flattened ends can also be used in this manner, when the diameter of the lead is too small to make heading practical.

Pressures in the range of 12,000 to 20,000 psi are normally used; temperatures required are in the 300° to 325° C range. These temperatures are well below the melting points of either the lead or the semiconductor, and the pressures are below the deformation point of the semiconductor.

Thermocompression bonding in this manner is being used to attach leads to diffused silicon diodes at Bell Telephone Laboratories. The 30 mil contact head covers almost the entire active area of the mesa-type diode. This configuration allows the passage of a high forward current.

Specifications for the use of thermocompression bonding in the commercial preparation of diodes and transistors are being prepared by Bell engineers. The method will allow the use of higher bake-out temperatures, and is an inherently cleaner procedure than present methods of attachment. Both considerations result in greater reliability of finished semiconductor devices.

Collapsible Road Markers

NEW, LOW COST emergency road marker that is easily carried in passenger cars and light trucks is made of cardboard. The new safety signal is two-sided — and diagonally banded with broad alternate stripes of light reflective beaded paint and daylight glow paint, both weatherproof colors.

Collapsible road marker is available in two handy sizes. 12″ high by 6-3/4″ wide and 9″ x 5-1/2″. (Signal Lite Road Marker Co.)

The road marker stands 12″ high and 6-3/4″ wide. It comes folded

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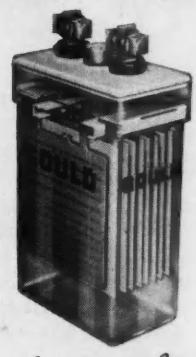

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flat; for use it is opened tent-wise and the bottom chord is held down with a suitable weight such as a stone or a car tool to prevent it from blowing over. It will collapse if struck, thus offering no traffic hazard in itself.

A smaller size, 9″ x 5-1/2″, is also available for tucking behind a sun visor or storing in the glove compartment of the car. It can be used as an emergency light-reflecting arm band.

Either of the markers may be taped or tacked to any vertical object or obstruction as a warning signal. The markers are priced to be expendable — low enough to be used as low cost advertising novelties or commercial give aways.

EDITOR'S NOTE
Got a problem?? Write it down and send it to John S. Reed, Technical Editor, "Telephone Engineer & Management," 7720 N. Sheridan Rd., Chicago 26, Ill. We'll do our best to give you the correct answer.

QUESTION: — *We have a location where telephone cable is to be placed on a Copperweld messenger. Would it be safe to use .045-inch stainless steel lashing wire in spinning the cable to the messenger?*

ANSWER: — It is perfectly satisfactory to use the stainless steel wire on Copperweld messenger strand. There will be no galvanic action between these two metals at the points of contact.

QUESTION: — *Our company is investigating the possibility of laying telephone cable directly from a delivery transport. The idea is to load the cable reels on supports mounted on the vehicle, deliver them to the job site, and pay the cable off the vehicle directly into the manhole and duct. Do you know of any company that uses this method?*

ANSWER: — We do not know of any company that has used the method of multiple loading of cable reels in the manner described. The usual practice is to haul one reel at a time on a reel trailer to the job site for unreeling the cable directly into the manhole and conduit. It takes time to install cable in conduit and the average cable placing crew would consider itself lucky if it could pull in four reels of cable in one working day. For this reason it is more practical to transport one reel at a time from a cable yard or other storage delivery point. Some companies may store reels of cable on a side street on a big cable laying project, but this is not considered to be as desirable as delivering the cable to the job as needed. We would like to have the opinion of our readers on the use of reel transportation methods.

QUESTION: — *We are planning to furnish safety hats to our construction crews. What points should be considered in this project?*

ANSWER: — Safety or hard-boiled hats are coming into use in many companies. Power linemen use hats made of glass-fiber for insulation from contacts with electric wires. Telephone linemen should also have hats made of this material for insulation as well as for impact protection. The maximum protection from blows as the result of a falling tool or other object is obtained when the hat has a suspension arrangement to provide space between the head and the inside of the hat crown. This space should never be less than 1-1/4 inches, otherwise the blow will not be absorbed to the maximum extent. The objection that this space lets in cold air in winter is met by providing winter liners. These liners are obtained in a skull style to protect the top-of-the head or a skater's style that covers the neck and ears as well.

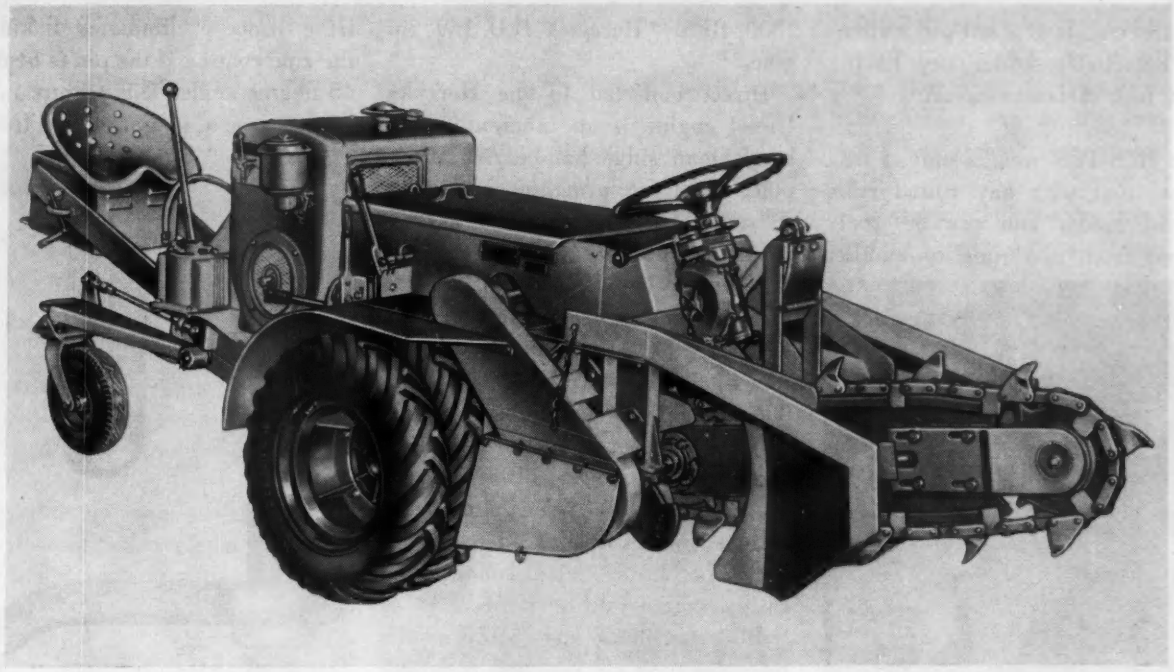
It is desirable to start a safety hat program on a voluntary basis, so that the men will more willingly accept the use of these hats after they have had the opportunity to observe how others wear them.

QUESTION: — *When a drop wire is to be placed from a lead across the road and must pass under a power line, we have often found it difficult to obtain proper clearance over the road and at the same time from the power wires. What course can be followed to get the proper clearances in such cases?*

ANSWER: — This is a common problem in rural areas where the telephone line is not in joint construction with power distribution lines. The proper method in situations such as you describe is to have the power company place a pole at the drop crossing point and make a passing attachment of the drop wire to the pole. This pole is to be of the proper length to obtain the desired height of the drop wire over the road and, at the same time, locate the power wires to adequately clear the drop.

If the subscriber can't wait for the joint pole to be placed, it will be necessary to place a drop pole on the same side of the road as the power line and run the drop down the pole to a lower attachment for the span to the subscriber's residence. The pole may have to be raked to keep the drop attachment at the top away the required distance from the nearest power wire.

IN THE NEXT ISSUE
In the March 1 issue of TE&M Mr. Reed answers a reader who asks — "What simple facts should be stressed to plant people in regard to plant maintenance."



RUBBER TIRED DITCHER: — New model 702-A rubber tired ditcher is a highly-mobile unit designed for narrow trenching. Designed to dig a maximum of 40 in. deep; the 702-A may be equipped with either a chisel toothed bucket line digging either three or five inches wide; or a hook tooth line digging 3½ or five inches wide. This choice of bucket lines makes the machine readily adaptable to a wide variety of underground soil conditions. Specifications and information on the new Model 702-A Ditcher may be obtained by *Checking New Product 128.*

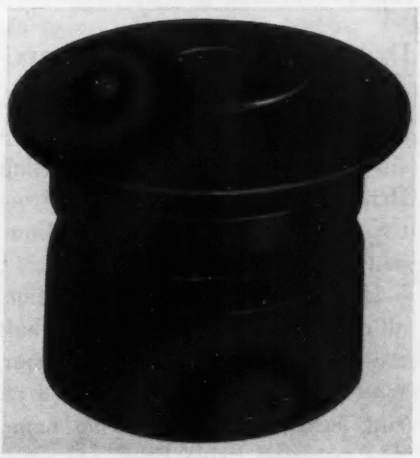
NEW PRODUCTS' SHOWCASE

By DICK REYNOLDS

Case Rubber Insulators

THE CASE RC-1, rubber insulator, manufactured by the Continental Rubber Works for Transandean Associates, Inc., eliminates the problem of mischievous damage so frequently encountered with the use of glass insulators. Since the new shatterproof RC-1 is practically impervious to "pot-shots" and rocks from sharpshooting vandals and hunters, it will reduce cost of emergency line maintenance due to insulator breakage and subsequent line shorts.

The RC-1 has excellent mechanical and electrical characteristics in adverse weather, retaining its elasticity and self-cleaning ability under sustained exposure to extremes of heat, cold, rain, fog and corrosive atmospheres such as salt or sand laden air. Under strong wind exposure it is capable of supporting the heavy load from large gauge copper and ferrous



wires over long periods of time without visible abrasion, considerably reducing both tie and line wire fatigue breaks.

A design improvement is the widening of the air gap between the bottom of the petticoat and metal frame of the bracket which gives a longer leakage path and assures more effective use of the petticoat's insulating properties in wet weather.

The RC-1 Rubber Insulator was designed for use on Case Crossarm or Mid-span transposition brackets and is applicable to both voice and carrier frequencies.

For complete technical information *Check New Product* 129.

New Ladder Accessory

A NEW safety step offered by Utility Tool & Body Co., has been developed to provide more safety and less fatigue for anyone who works for prolonged periods on ladders.

The unit consists of a one-piece aluminum detachable ladder step having a foot rest surface measuring 5″ x 12″.

The RES-TEP weighs only 4 lbs., can be used with any round rung standard ladder and can be easily changed from one rung to another

in a few seconds. Complete safety and comfort are assured on any rung regardless of tilt of the ladder. The unit can be used on double extension ladders as well as on single ladders. No adjustments are necessary at any time and ascent or descent is not impaired. Deep diamond tread on the entire foot surface prevents slipping.

For further information, *Check New Product* 130.

Diesel Generating Plants

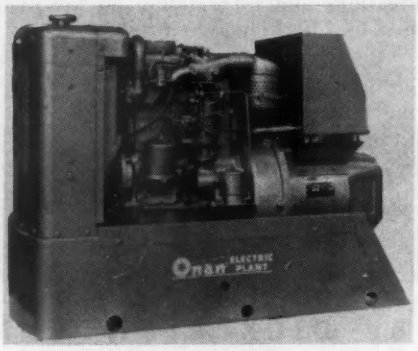
A NEW series of water-cooled, Diesel-driven, electric generating plants has been announced by D. W. Onan & Sons Inc.

Series DZB generating plants are available in either 10,000 or 15,000 watt A. C. size ranges and in all standard 60 and 50 cycle voltages to 460 volts. Completely self-contained, they will provide full-rated electric power for both *primary* power applications for contractors, oil fields, resorts . . . anywhere a dependable, *continuous* source of electricity is needed . . . and all types of *emergency* standby power applications where low-volatile Diesel fuel is preferred over gasoline.

Prime mover for the new DZB Series is the 3-cylinder, 37 HP (at 1800 RPM) Hercules D.D. 149 engine.

Direct-connected to the Hercules Diesel engine is an inherently-regulated Onan single-ball-bearing, four-pole, revolving armature generator. A semi-flexible drive disc assures permanent alignment. The generator has a generous overload capacity . . . provides voltage regulation of plus or minus 5% with frequency regulation of 3 cycles maximum. The 10,000-watt, 60-cycle units (single-phase) are rated at unity Power Factor. 50 cycle models (10KW sizes) are available in the same voltages and ratings. In 15KW sizes, these models are available in similar voltages and ratings but derate to 12.5KW.

Both the 10DZB and 15DZB models have the controls installed in a self-contained, enclosed cabinet mounted on top of the generator. These include a battery charge rate ammeter,



water temperature gauge, oil pressure gauge, highwater temperature cutoff momentary start-stop switch and output terminal block.

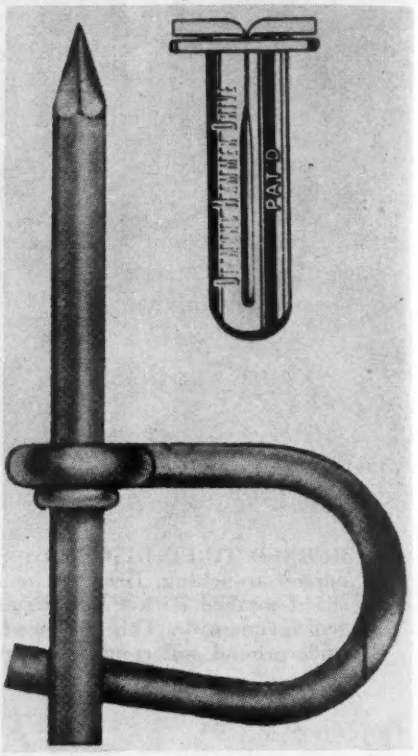
For further information, *Check New Product* 131.

Drive Rings & DHD Anchors

INSTALLATION of Neoprene jacketed drop and block wiring is a simple three step operation using Drive Rings and DHD Anchors from the Diamond Expansion Bolt Company, Inc.

Using the Diamond combination, all a worker has to do is: drill a hole the same size as the DHD Anchor, insert the anchor, position the drive ring held wiring, and drive home. The patented drive rings are made with striking end elevated above the ring, making it easy to drive without bending the ring or pin.

The Diamond "hot dip" galvanizing process eliminates flaking of the zinc coating if the pin is bent to a 45 degree angle. This feature insures further ease of operation and freedom



from danger of flying zinc chips striking the ring installer.

Installation is further enhanced when the drive ring is used in combination with Diamond's Hammer Drive anchors. This forged aluminum, one piece anchor has internal rifle barrel rib construction that provides variable radial expansion for secure fastening despite irregular hole size.

For additional information *Check New Product* 132.

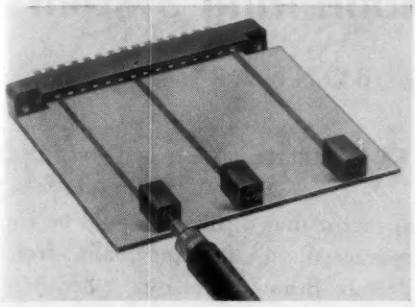
Printed Circuit Test Point

THE ELECTRONIC Sales Division of DeJur-Amsco Corp. has announced a new series of single and multi-contact test point connectors to check printed circuitry in various applications.

All types accept a standard .080 test probe, and have pins for right angle dip soldering to a printed circuit board. The body is molded of arc resistant mineral filled Melamine or glass reinforced Plaskon Alkyd (other materials available on order).

These connectors can be ordered with either one, six or 16 test points for easy test probe insertion. The single contact Series TJ can be supplied with conventional socket and

single pin, or with closed ring entry contact and molded-in stabilizing stud. This feature provides extra pro-



tection against probe damage and movement of test point during probe insertion.

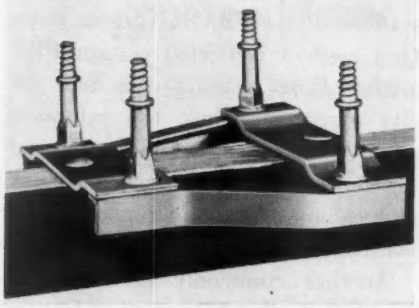
All socket contacts are spring temper phosphor bronze, gold plate and silver plate. Current rating is 5 amperes continuous and 7.5 amperes maximum.

For further information, *Check New Product* 133.

Transposition Brackets

NEW POINT-TYPE transposition brackets for transposing communication circuits are being offered by Line Material Industries.

The brackets may be mounted easily on crossarms by means of two standard 1/2-inch carriage bolts.



They feature box-type construction for high strength and rigid assembly along with threaded pin shanks for simplified pin replacement. All parts are projection welded after galvanizing to eliminate pickling acid deposits.

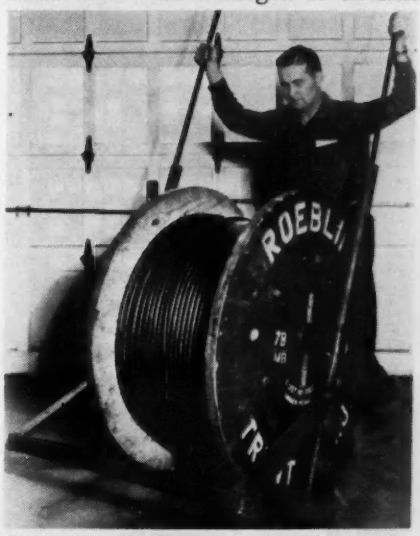
These brackets are REA approved and meet specification No. PE-18 for heavy-duty brackets.

For further information, *Check New Product* 134.

One-Man Lift-Stand

HEAVILY loaded cable reels are raised and positioned for cable payout with the portable Hykon Reelift. The device, using ordinary on-the-site conduit to extend lifting leverage, permits a workman to lift an 1152 lb. reel as illustrated. Two men raise the larger reels weighing over one ton.

Adjustable to various reel diameters, the Reelift has an all-welded base of reinforced angle-iron and measures 3 ft. x 2 ft. It accommodates reels with damaged or broken



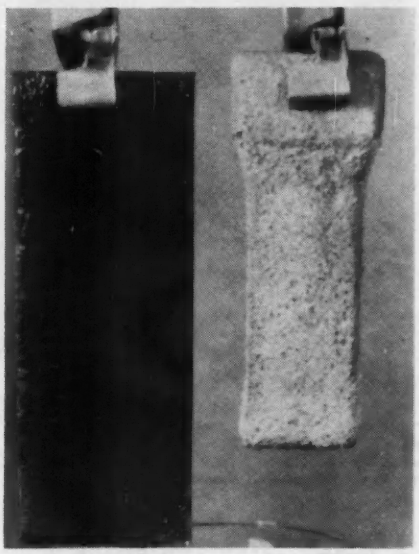
flanges and does not require jacks or accessory equipment. The Reelift handles up to 48″ diameter reels. All surfaces are weather and rust protected by an industrial enamel finish. For further information, *Check New Product* 135.

New Flooring Material

A NEW flooring material which can withstand up to 50% inorganic acid conditions without corroding has been developed by the Stonhard Co., Inc.

Called Stonclad, this material will withstand hot concentrated alkaline solutions up to 170° and nitric acid up to 15%. It will resist highly concentrated sulphate solutions. Main feature of Stonclad is its ability to resist corrosion damage from acids and alkalies and at the same time stand up under extremely heavy traffic.

Trowel applied, the product is packaged in three ready-mix parts which are combined at the job site. Under normal conditions the mixture will remain workable for more than an hour. A new installation may be used for foot and light truck traffic after five hours. One unit of Stonclad ap-



plied at ⅛″ thickness will cover 75 sq. ft.

In most cases no special floor preparation is required. Simple cleaning is usually sufficient preparation before application of the product over the old surface. Nor is there any need to remove machinery. The product can be formed, and bonds tightly, to the base parts of equipment.

For more information, *Check New Product* 136.

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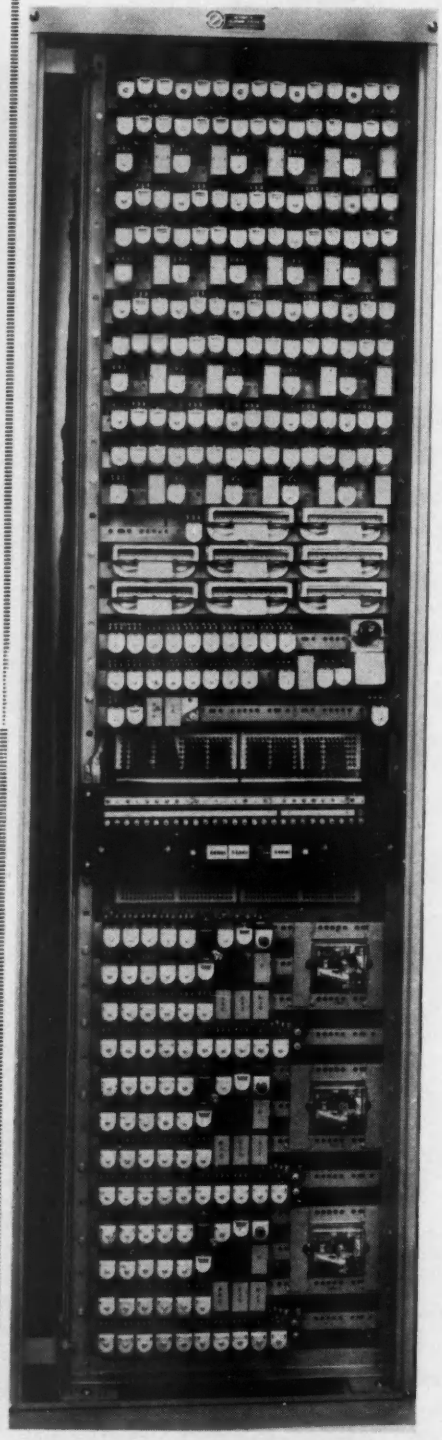
New Trunk Restrictor Gives PBX User Adequate Toll Call Monitoring System

By JAMES G. BONNAR*



TYPICAL Trunk Restrictor with front cover panel removed showing, from top to bottom, the trunk adapters, common equipment, number test and jumpering section, fuse and message register panel and finally the registers at the bottom. The equipment is housed in standard metal cabinets 81 7/16″ high by 23 5/8″ wide by 12″ deep.

WITH THE advent of Direct Distance Dialing (DDD) it became apparent that difficulty would be encountered in handling calls from Private Branch Exchange extensions using the new media. This was brought about because no limitations were put on the placing of calls from any extension located in the PBX through the toll system.

At the same time, message rate calling in metropolitan areas was reaching proportions that made it a factor to be considered in evaluating the cost of PBX service. Calling in message-rate areas in many cases involved numerous offices. Some were of single unit charge while others involved multiple unit calling and since there can be a multiplicity of offices in message rate areas the policing of calls throughout the area is difficult.

Prior to DDD it was possible to restrict the placing of a toll call by stations of the PBX in various ways. One method restricted certain PBX stations from making calls into the city exchange. Thus, the extension could not be used for calling beyond the confines of the branch exchange and calling to toll points was automatically restricted.

Another commonly used method involved placing a restricting feature on the city trunks to prevent calling of the toll operator by anyone other than the PBX attendant. DDD did not affect the use of the first method. However DDD did make it impossible to restrict the placing of toll calls as the extension user could place a call to any point reached over the DDD network without the services of an operator and on many DDD calls it is not necessary to employ any access code to reach the automatic ticketing equipment. Also, because the indication to the PBX equipment that

**Mr. Bonnar is acting director of research and development, North Electric Co., Galion, Ohio.*

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CITIZENS UTILITIES COMPANY OF CALIFORNIA
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DE LEON TELEPHONE CO., INC.
Carbon, Texas
DELTA TELEPHONE AND TELEGRAPH COMPANY
Courtland, California
(Toll Center Intercept serving 4 exchanges)
DORRIS TELEPHONE COMPANY
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EGYPTIAN TELEPHONE COOPERATIVE ASSOCIATION
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Rice, Illinois
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FINGER LAKES TELEPHONE CORPORATION
Rose Hill, New York
FOUNTAIN GREEN TELEPHONE COMPANY
Fountain Green, Illinois
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GRACEBA TELEPHONE COMPANY
Cottonwood, Alabama
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Lyle, Washington
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PALESTINE TELEPHONE COMPANY
Birds, Illinois
PALMERTON TELEPHONE COMPANY
Kresgeville, Pennsylvania
Kunkletown, Pennsylvania
Palmerton, Pennsylvania
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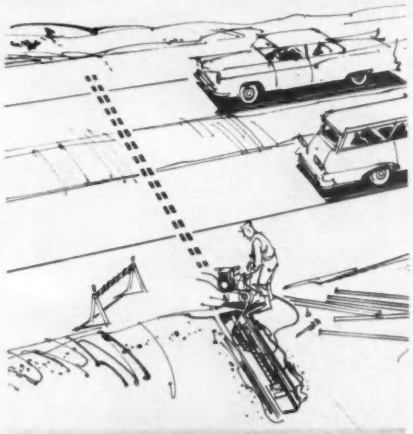

Greenlee Hydraulic Pipe Pusher

Traffic proceeds as usual when your piping for underground cable crosses under the street this simple timesaving way. Model No. 790 shown pushes ¾" - 4" pipe about two feet per minute with power pump. A small ditch in the parkway accommodates the pipe pusher — streets and walks remain undisturbed, total job time is cut to a fraction. Ask your supplier for details or write for free literature.

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a toll call is being placed has such variable combinations the normal methods of restriction were rendered useless. It is true the call could be placed and would be properly billed to the PBX number, but no indication would be given as to the PBX extension from which the call originated. This opened the way to the placing of unauthorized calls not properly chargeable to the business for which the private system was installed as it was impossible to restrict or monitor toll calls.

One of the early problems arose in the case of military installations in which it was the duty of the Post Signal Officer to certify each month's billings with the statement that all charges were true and properly chargeable to the United States government.

One of the larger installations of this type suffered from an increase in toll charges with the advent of DDD in the area in which it was served. It was felt this could only be attributed to the fact that a number of unauthorized calls were being placed from the PBX extensions, since no extensive increase in need for long distance calling was apparent.

Contacts with the local telephone company indicated a restriction placed on direct dialed toll calls from the PBX would involve interference with other calls in the area, a factor which was not acceptable to the telephone company or to other enterprises located in the office. It was also indicated that any restriction placed on DDD from the extensions would also restrict the placing of direct dialed toll calls by the attendant, unless separate groups of trunks were employed with the resultant loss of traffic efficiency.

The answer to the problem was then to make such restriction at the PBX, where it affected only calls from that point, and at which point the differentiation between operator-originated calls and extension originating could be more easily made.

A study of the problem indicated that the need was for the identification of the first three digits of the called number to determine if the call was acceptable or unacceptable.

In the particular area calls also were metered on a zone basis. This meant that although the call did not enter the nationwide network, excessive charges could be incurred by the placement of certain calls within the metropolitan area. Restriction of these calls could also be accomplished by an identification of the first three digits of the called number since each exchange in the area had its own exchange and number even though no area code was used.

Since the time required to register and identify these three digits was such a small part of the total time of any call, it was of course impractical to associate the equipment with each individual city trunk of the PBX so a device called the North Trunk Restrictor was devised.

In principle, its operation is to pick up each trunk simultaneous with its seizure by the extension and connect that trunk to a register which will, without interfering with the passage of pulses to the city exchange, record the first three digits of the called number.

This register on receipt of the three identifying digits can then be connected to an identifier. This identifier is, by a prearranged strapping, able to compare the number dialed with a block of area codes or office codes, and immediately determine whether or not the call is to be placed to a message point beyond the base rate area, or to an office or area for which a toll rate will apply. This applies to calls either in the local area, or in another area anywhere in the nationwide network.

If the call is identified by the equipment as being one which has been authorized for toll or DDD calling, the restricting equipment is released and the call can proceed in the same manner in which any unrestricted call would be placed from a PBX to the associated connecting city exchange. All of this checking is done with no interference to the progress of the call, and no indication is given to the calling station that any monitoring is being done.

If, however, the check by the Restrictor indicates the call is one on which an unauthorized extra charge

will be assessed, progress of the call is immediately stopped and any further digits dialed by the person at the extension are blocked from being effective at the city office.

Disposition of any blocked calls from this point on is a matter which can be considered from several optional points of view. One of the early methods used was to merely dump the call and free the trunk. This was chosen in this particular case because of the large amount of legitimate traffic which was to be handled by the circuits, so it was felt that the saving in trunk time was the paramount factor.

Another method employed is to immediately switch the termination of the trunk call to the attendant, from which point it can be monitored, and completed or refused when the operator has determined the legitimacy of the calling party's motives in placing the call. Still another method employed is to route the call to a recorded announcement point which will give an indication to the calling party of why his call is not progressing and also provide instructions for the proper placing of such calls.

Since the Restrictor equipment is placed at the PBX it is quite possible to eliminate the checking of called numbers when the placement of calls is by the operator, even though the same circuits are used both by the operator and by the extensions.

Unauthorized Calling Halted

ON THE early installations it was apparent that the need for the equipment was real rather than imagined. In nearly all installations the toll charges and message rate charges were reduced by a factor of approximately 50% the first month the equipment was in operation. Since no effort is made to interfere with legitimate toll calls, the savings came only from the halting of unauthorized calling. Any personal, non-business or even business-connected toll call can still be placed from the unauthorized extension, with the services of the operator, who is able to identify the calling station and determine responsibility for charges.

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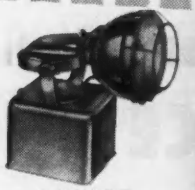

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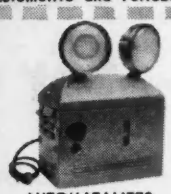

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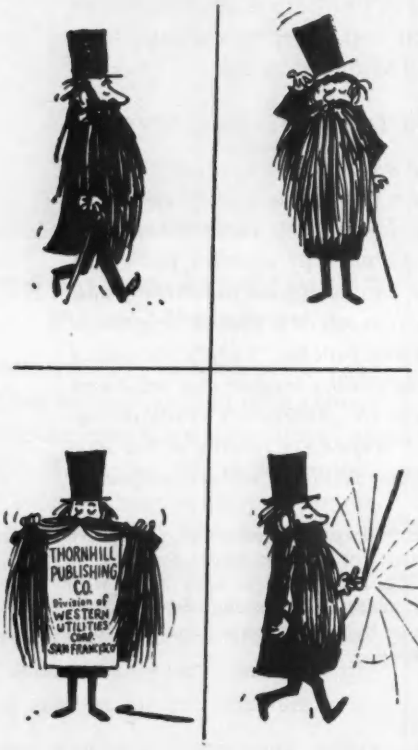

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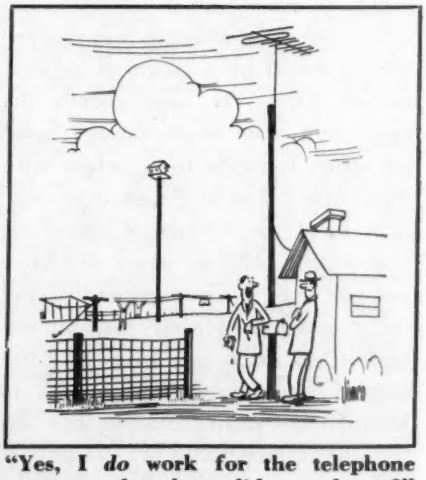
equipment of course present themselves. One, is to route the call through toll ticketing equipment which will properly identify the calling station when the Restrictor has determined whether the call is one to be charged or one on which no charge is applicable.

It is quite possible that it may be desirable to allow certain PBX stations access to the DDD network without restriction. The equipment is arranged to provide this facility by the use of a simple line identifier method. Thus, when a station seizes the city trunk the call is checked to indicate whether or not it is one of those stations allowed direct access. If it has a direct access the Restrictor equipment is not employed and the call passes through without any checking. The number of stations so arranged are at the discretion of the PBX subscriber and may be changed or revised as circumstances require.

In all, the satisfaction of the PBX customer with being able to properly monitor his charges has been a great factor in the successful adoption of the unit. With the introduction of automatic equipment within motels and hotels and other public or semi-public locations from which calling may be unmonitored, the factor of unauthorized toll calls is becoming a serious problem for subscribers to PBX service and consequently to the telephone company. This unit is another factor which will remove the fear of being burdened with questionable charges from the minds of those endeavoring to modernize their PBX service. — *James G. Bonnar.*



"Yes, I *do* work for the telephone company, but how did you know?"

"Signaling"

(Continued from page 38)

The results of a study to determine the delay in the transmission of personal signals due to integration of the signaling and mobile telephone channels are summarized in *Figure Six.*

The curves on this figure indicate in cumulative percentage form the excess time for transmission of signaling calls due to the dual use of the radio channel over a nominal time of about 0.2 minute which is required for transmitting a call when the radio channel is immediately available.

Each curve applies to signals sent during normal working hours in a five-day business week. One curve is for the week showing the largest displays and the other for the week having the smallest delays. The number of pocket receivers in service during the week and the percentage of time the mobile telephone channel was in use is also indicated for each curve.

The average delays for the other weeks during which data were available fall within the range of the figures given. Under the worst condition the average delay was about 0.9 minute and less than 10 per cent of the calls were delayed by more than three minutes.

Determination of the number of signaling receivers which can be accommodated on the channel without too much degradation in either the mobile telephone or the signaling service will require more information than that available from the initial six weeks of operation.

One aspect of this problem is the delay in transmission of the signaling calls caused by the mobile telephone usage of the channel discussed above. Other factors are delays in completion of mobile telephone calls and cancellation of such calls because of a channel busy condition. In the case of mobile telephone calls originated by mobile units, there is also the possibility of calls "not attempted" because repeated listening on the channel indicates it to be busy. No reports of this latter condition have been received.

Next page, please

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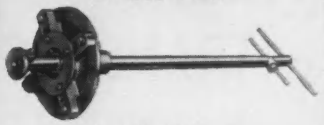

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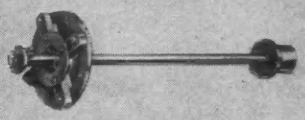

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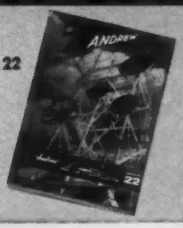

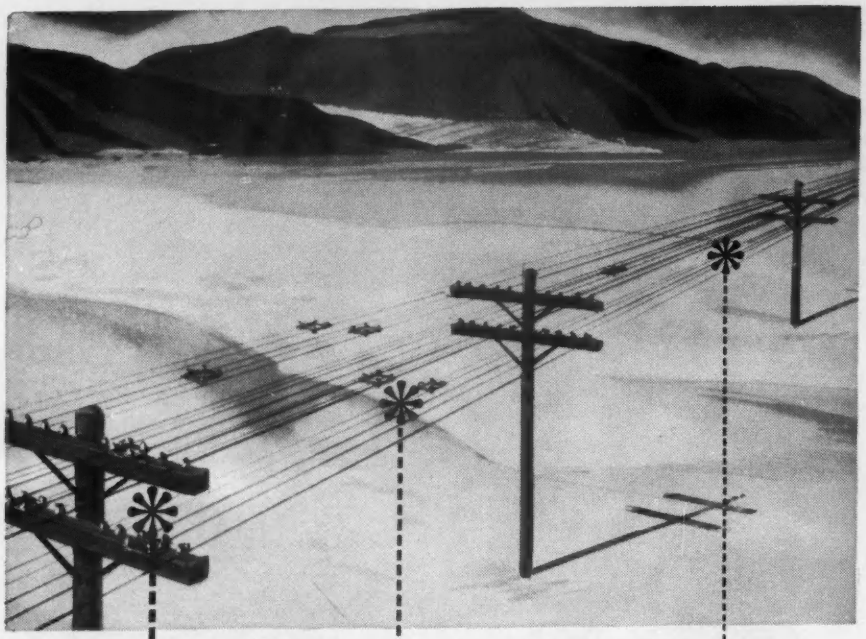

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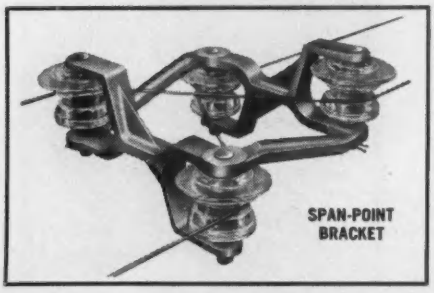

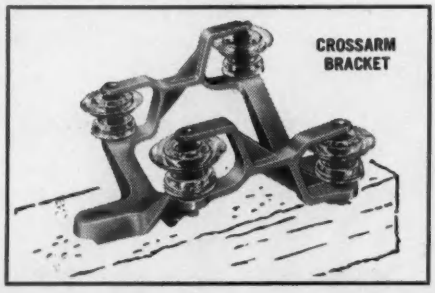

As time goes on it is planned to make further observations of the type outlined above with a view to determining the performance of an integrated service of this type from the commercial and traffic standpoints. In the meantime, experience has indicated that operation of a signaling system employing standard operator techniques on the same radio channel with a mobile telephone system is technically feasible.

Summary

PERSONAL signaling is a new type of telephone service. This service was initiated about a year ago in Allentown, Pennsylvania. More recently, an improved system sharing a radio channel with an existing mobile telephone service system was placed in operation in Columbus, Ohio. This improved system, including the arrangements employed for integrating it with a mobile telephone service system, has been described. Some of the factors involved in operating the two services on the same channel have been pointed out and initial operating experience with the new system has been evaluated.

It appears that:

1. Operation of personal signaling and general mobile telephone systems on the same radio channel is technically feasible.
2. Experience during the first nearly two months of operation indicates the average delay to signaling calls due to sharing of the radio channel with a heavily loaded mobile telephone system is under one minute.
3. Less than 10 per cent of the signaling calls were delayed more than 3 minutes.
4. The majority of the customers in this experimental system are well satisfied with the service.

Acknowledgements

THE AUTHORS wish to acknowledge the efforts of all who contributed to this project. In particular, credit should be given to Mr. Ernest Gatzert of the Stromberg-Carlson Co. who designed the Signaling Control Terminal and Mr. R. W. Collins of

the Bell Telephone Laboratories who worked out the arrangements for the integration of the mobile telephone and signaling systems.

References

(1) C. R. Kraus, "City-Wide Personal Signaling at Allentown-Bethlehem, Pa.," Conference Paper presented at AIEE Summer General Meeting and Air Transportation Conference, Buffalo, N. Y., June 22-27, 1958.

(2) J. W. Young, "Pagemaster Receiver and Modulator Equipment", Loc. cit.

(3) W. Strack, "Systems Engineering of Personal Radio Signaling Systems", Loc. cit.

C. R. Jones Elected V. P. Carolina Tel. & Tel. Co.

THE EXECUTIVE Committee of the Carolina Tel. & Tel. Company meeting at Tarboro in regular session December 30, 1958, elected C. R. Jones vice president and chief engineer effective as of that date. Other vice presidents of the company are J. K. Avent for operations and J. F. Havens for personnel and public relations.

The new vice president is a native of eastern North Carolina, having spent his youth in Pink Hill. He graduated from the University of North Carolina at Chapel Hill in 1928 with a degree in electrical engineering. His telephone career began in 1928 when he became a junior engineer for Southern Bell in Atlanta. In 1929 he was transferred to Nashville as plant engineer.

In 1935 he became transmission engineer and later was made transmission maintenance supervisor of the Tennessee division. In 1939 he was sent back to Atlanta as a supervisor in the General Plant Department. During 1941 he became transmission maintenance supervisor in the General Plant Department at Atlanta where he remained until he joined the Carolina Company.

Jones came to the Carolina Company as transmission and protection engineer in 1944 and was made assistant chief engineer in 1946. He became chief engineer in 1951.

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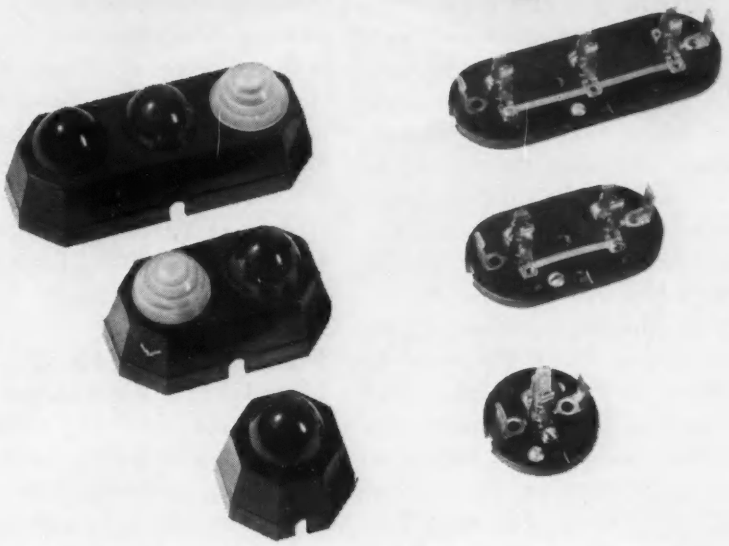

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TELEPHONE ASSOCIATION ACTIVITIES

J. W. Tobin Heads So. Dakota Association

TAXATION and regulation were among the top subjects discussed at the 54th annual convention of the South Dakota Telephone Association. Speakers addressing the meeting included: R. B. "Duke" Matson, mayor of Huron; E. Cogley, Sioux Falls; Myron E. Hoyt, of the Bureau of Internal Revenue, Aberdeen S. D.; Kenneth Holum, president of the South Dakota Rural Telephone Association; Roy Frazen, plant staff supervisor of the Northwestern Bell Telephone Co.; Bruce E. Gills, commissioner of Revenue, Pierre; Captain R. D. Chase of The Sioux Falls Air Defense Filter Center; D. E. Misfeldt, Utilities Valuation Engineer.

The South Dakota Public Utilities Commission was represented by the Commission Secretary, F. Norman, and Engineer Elwin Quinney.

Mrs. Genevive Cox, district traffic supervisor, Northwestern Bell Telephone Co., conducted the Operator's Corner.

Officers for the coming year are: J. W. Tobin, Citizens Telephone Co., Plankinton, president; K. P. Ellefson, Sioux Valley Telephone Co., Dell Rapids, vice president; L. J. Armentrout, Armour Telephone Co., Armour, secretary-treasurer.

Directors are as follows: Kenneth Hauge, Alexandria; Kenneth Conners, Jefferson; K. P. Ellefson, Dell Rapids; M. H. Hirt, Sioux Falls; J. W. Tobin, Plankinton; R. G. Price, Highmore; Marcus Eastby, Sinai; P. F. Orcutt, Custer; and Leslie Jensen, Hot Springs.

Fred S. McGee Heads Florida Tel. Association

HOLDING their 51st annual convention at the Soreno Hotel, St. Petersburg, members of the Florida Telephone Association participated in a two-day meeting that properly placed its emphasis on the future.

This theme was emphasized by the first convention speaker, Roger Early, science editor of TV Station WFLA, Tampa, when he discussed "Man and The Space Age," and by the second speaker, Joe S. Stone, operating vice president — East, Southern Bell Telephone & Telegraph Co., Atlanta, Ga.

Discussing "Growth — A Problem And An Opportunity," Stone pointed out that "To keep up with growth and meet all the public's needs and desires for service, telephone companies have to have adequate earnings in order to provide the necessary expansion of facilities."

"Nothing can be more important than this," he said. "Yet, the very expansion of facilities makes the problem of maintaining adequate earnings more difficult. Even if we were not adding any new plant, but merely undertaking to make normal replacements of plant and equipment for maintenance reasons, our average investment per station would increase due to inflation and rising costs."

Emphasizing that during recent years inflation has run up the costs of all things telephone companies buy, Stone said, "Other businesses — automobile, steel, any non-regulated business you can mention — have raised their prices to meet these increasing costs. Regulated companies have not been able to do so."

"Every rate case my company has had in recent years has been a hard struggle," he stated. "In some we have been able to secure a portion of the increase we requested; we have failed in several others. This despite a clear showing of need and of a very small increase per individual telephone."

Pointing out that in 1957 the leading manufacturing concerns in the United States, all non-regulated, earned an average of 12% on their invested capital, Stone reported telephone companies in the Southern section of the country averaged earnings only about one-half that amount.

"All indications point to further inflation," he stated. "If telephone companies are not allowed to maintain adequate and reasonable earnings, it follows as night follows day that our plants will depreciate, the service will deteriorate, new service needs cannot be met and our customers will forsake us. . . ."

Hugh A. Barnhart, president of the United States Independent Telephone Association and president of the Rochester (Ind.) Telephone Corp., told the convention that the telephone industry is in the early stages of fundamental alterations in the telephone service itself.

"We have stepped across the thresh-

DIRECTORS of the South Dakota Telephone Association: Standing (l. to r.) KENNETH HAUGE, Alexandria; KENNETH CONNERS, Jefferson; K. P ELLEFSON, Dell Rapids; M. H. HIRT, Sioux Falls; J. W. TOBIN, Plankinton; R. G. PRICE, Highmore; Seated (l. to r.) MARCUS ESTBY, Sinai; P. F. ORCUTT, Custer; LESLIE JENSEN, Hot Springs; L. J. ARMENTROUT, Armour.

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hold of a changed conception of telephone service," he said. "It is comparable to the transition from handcraft to mechanized factories in the early part of the 19th century, and from sail to steam on the seven seas. These changes come largely from the application of electronics, but also as a result of changing population, changing habits of life, and a certain renaissance within the telephone industry itself."

Pointing out that today's telephone instrument is a streamlined, highly refined and scientifically designed edition of the telephone "our grandparents were using when this century began," the USITA President stated recent developments in electronics have inaugurated a new era.

Commenting on the need for a new unity, a new feeling of mutual relationship among those who have faith and confidence, as well as a financial stake in public utility enterprises, President Barnhart stated that "In the United States Independent Telephone Association, we have the means and the mechanics, if you please for checking our progress, for propelling our national movement forward, for protecting our common interests, and for jointly facing up to the job that lies ahead."

Mitchell N. Drew, president, Quincy (Fla.) Telephone Co., presided at the Traffic Conference. Speakers were Louis Groot, district traffic manager, Southeastern Telephone Co., Crestview; E. A. Maddox, district traffic superintendent, Southeastern Telephone Co., Tallahassee; Fred Campa, toll equipment engineer, General Telephone Co., of Florida, Tampa; and Mrs. Frances Hill, traffic instructor, Southern Bell Telephone & Telegraph Co., Jacksonville.

Joe K. Galloway, executive vice president, Winter Park (Fla.) Telephone Corp., presided at the Plant Conference. Speakers were William F. Weaver, administrator, education and training section, Martin Co., Orlando; Kenneth F. Peloquin, assistant secretary and administrative assistant, Winter Park Telephone Co.; and F. E. Norris, vice president, planning & development, General Telephone Co.

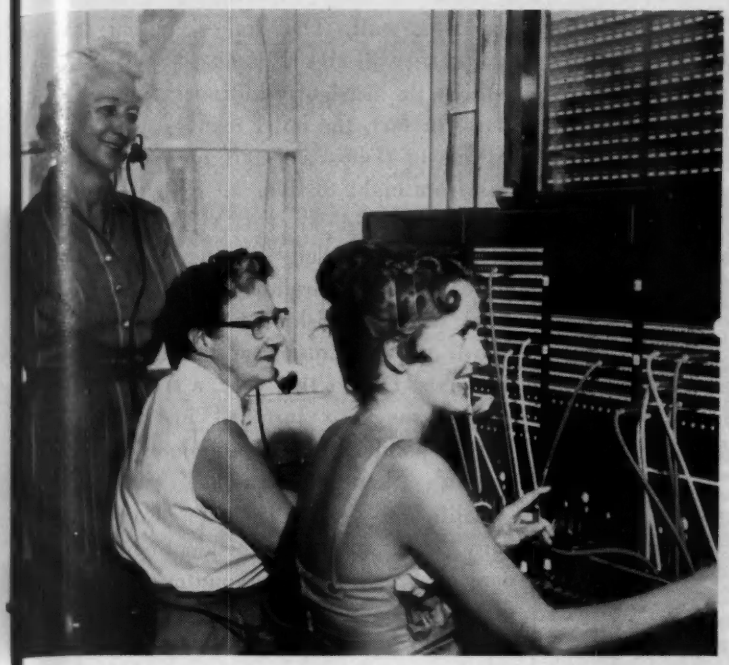
Officers of the Florida Telephone Association (Standing, l. to r.): 1st Vice Pres., E. M. MENENDEZ, Tallahassee; Director, J. L. SHARIT, Port St. Joe; 2nd Vice Pres. JOHN B. RENWICK, Tampa. Seated, l. to r.: Pres., FRED McGEHEE, Marianna; Sec.-Treas., Miss JOSEPHINE POPPLETON, Tampa.

Officers of the Florida Telephone Association are: president, Fred S. McGehee, West Florida Telephone Co., Marianna; 1st Vice President, E. M. Menendez, Southeastern Telephone Co., Tallahassee, 2nd Vice President, John B. Renwick, General Telephone Co. of Florida, Tampa, and Secretary-Treasurer, Josephine Poppleton, General Telephone Co. of Florida, Tampa.

Executive Committee members are Fred S. McGehee, Chairman; M. L. Barre, Jacksonville; Carl D. Brorein, Tampa; J. K. Galloway, Winter Park; J. N. Johnson, Ft. Myers; Josephine Poppleton, Tampa; J. L. Sharit, Port. St. Joe; Blair C. Stone, Tallahassee, and Max Wettstein, Ocala, Ex Officio; Hugh C. Macfarlane, attorney.

Members of the board of directors are M. L. Barre, Jacksonville; H. A. Bishop, Starke; P. E. Brannen, Ft. Myers; Carl D. Brorein, Tampa; Carl D. Brorein, Jr., Tampa; E. L. Cox, Perry; M. N. Drew, Quincy; B. A. Galloway, Winter Park; J. K. Galloway, Winter Park; J. N. Johnson, Ft. Myers; Ralph Maner, (Representing Manufacturers), Tampa; Fred S. McGehee, Marianna; E. N. Menendez, Tallahassee; Josephine Poppleton, Tampa; John B. Renwick, Tampa; J. L. Sharit, Port St. Joe; R. W. Shriner, Tampa; Blair C. Stone, Tallahassee; Max Wettstein, Ocala; Otto Wettstein, III, Live Oak; C. J. Yates, Jacksonville; and Hugh C. Macfarlane, Attorney.

NEW OFFICERS of the Georgia Telephone Association are: (Seated, l. to r.): E. R. BRITT of Metter, secretary and treasurer; C. J. MATHEWS of Statesboro, president. (Standing, l. to r.): GLENN BRYANT of Hinesville, second vice-president; and J. P. GLEATON of Tifton, first vice-president.



C. W. & T. PBX Service Advisor instructs El Mirador operators on how to operate the new PABX switchboard.

DOAK DAVIS (left), mgr. Palm Springs District, with RICHARD VEER, mgr., El Mirador Hotel.

industry NEWS briefs

Hotel PABX Installation Completed In California

THE FIRST hotel PABX system to be installed by an Independent telephone company went into operation recently at the world-famous El Mirador, the oldest and largest hotel in Palm Springs, Calif.

The new system, installed by California Water & Telephone Co., permits guests to call any room in the hotel by dialing the room number. Similarly, hotel services can be dialed according to instructions clearly marked on the dial plate of each telephone. Guests also can dial their own calls within the Palm Springs area without going through the hotel's switchboard operator.

Each of the El Mirador's 200 rooms and cottages is equipped with the modern dial telephones. 208 dial telephones and 71 non-guest telephones were installed. It took a year to develop and assemble the special equipment needed to serve the hotel. Installation was made in 60 days.

Business-wise, the $70,000 investment in the new system will allow the hotel to reduce its operating costs by almost 50%. In addition, intangible profits will undoubtedly be realized as a result of faster, improved service.

The hotel dial system first came into consideration two years ago, when El Mirador management and California Water & Telephone Co. sales personnel and engineers discussed possible means of expanding and improving the hotel's telephone system in order to cope with the ever-increasing volume of calls.

Analysis by telephone people in March, 1957, revealed nearly 10,000 calls a week emanated from the hotel. Consequently, it was decided automatic dial service, although still in the experimental stage at that time, would be the most practical solution to the heavy traffic problem.

Installation of the system was delayed until this year because of the problem of metering, for billing purposes, outside calls made by guests. This problem ultimately was solved by developing and installing message registers which automatically record the number of local calls originating from each guest room. The meters are connected to the telephone circuit in such a manner that, when a called party answers, the meters are automatically operated. The system also prevents a caller from being charged for an incompleted call.

Another vital part of the system is the digit restricter, which prevents any unmetered long distance calls from going through the direct dial system. Long distance calls, both incoming and outgoing, are handled through the hotel's switchboard operators.

Upon checking out, a guest's telephone bill, listing all local and long distance calls made, is immediately available. The message metering system has the added advantage of vastly simplifying the hotel's accounting procedure because it reduces the local call listing to a single posting, thus saving time, personnel, paper work, recording and space.

In addition to increased speed and convenience, the new dial system has helped overcome the problem of fluctuating occupancy and the consequent difficulty of maintaining an adequate

High strength alone is not enough to insure dependable performance in a telephone line wire. The wire also must have high fatigue endurance to provide the margin of safety so necessary in long-span construction. *Crapo* HTL-135 Telephone Line Wire combines high tensile strength and high fatigue endurance with excellent transmission quality to make it the most reliable and economical conductor available for rural subscriber lines. Time and time again, this rugged wire has proved its ability to withstand heavy ice and wind loads, severe temperature changes, vibration and shock damage. The reason is that *Crapo* HTL-135 is tailored to do the job for which it is intended and to do it at the lowest cost commensurate with sound engineering practice.

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operating staff. The dial switching equipment will absorb increased calls without the need of additional operators. In fact, the hotel management expects to reduce its staff of operators from eight to five.

Although similar PABX systems have been installed in other businesses, the El Mirador is only the third such establishment in the nation to provide automatic dialing for its guests. Earlier this year, a similar system was first installed in New York's Waldorf-Astoria and later in Boston's Sheraton-Plaza by Bell.

California Water & Telephone Company, 12th ranking Independent company, is the first of the country's Independent systems to make this installation. The company provides telephone service throughout California's desert resort area, as well as metropolitan and suburban portions of Los Angeles. At present, company-owned stations total almost 140,000 and the company's total plant investment, including water facilities, is approximately $90,000,000.— *C. T. Pitts.*

General Tel. of Ohio Advances R. N. Cole

FOUR organizational changes within the General Telephone Co. of Ohio have been announced by Clare E. Williams, company president.

Richard N. Cole, general commercial manager, has been named administrative assistant to the president. Cole started his telephone career in 1936 with the Automatic Electric Co., Chicago, Ill., in the sales division. A native Chicagoan, he served the Wabash Telephone Co. and Illinois Telephone Co. until 1947 when he accepted an appointment as general superintendent of Ohio Consolidated Telephone Co. From this position, he progressed to general manager which was followed by an appointment to vice president and general manager.

In 1950, Cole was named president of Ohio Consolidated and remained in that capacity until the company became part of the General Telephone System. In 1957 he was named general commercial manager for General of Ohio and Ohio Consolidated.

Marvin R. Johnston, general com-

THE NEW MINIATURIZED WILKINSON LINE LOCATOR MODEL W-3

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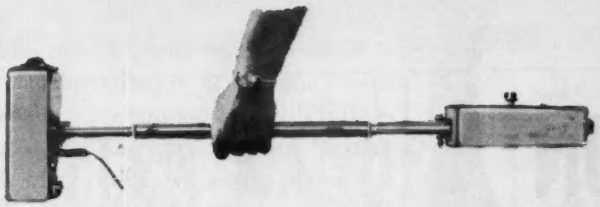

It's as handy as a flash light. The transistors rarely, if ever, require replacement; non-leak mercury cells outlast old type batteries at least ten times. The instrument cases are molded glass fibre. The aluminum connecting handle telescopes to 17 inches, and the entire instrument comes in a substantial carrying case.

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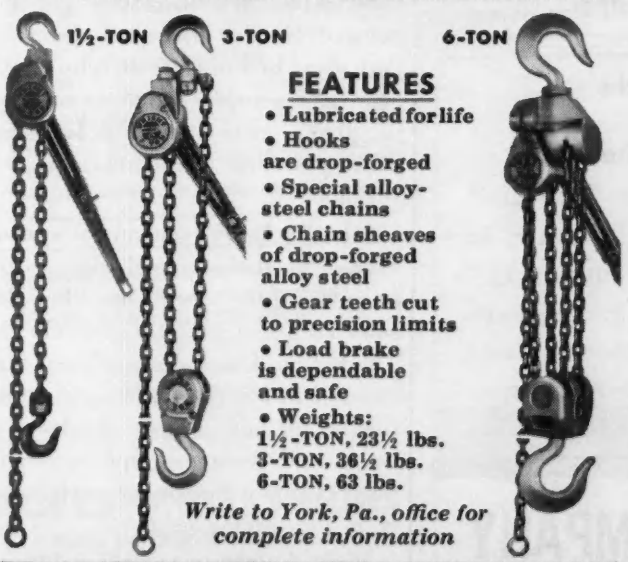

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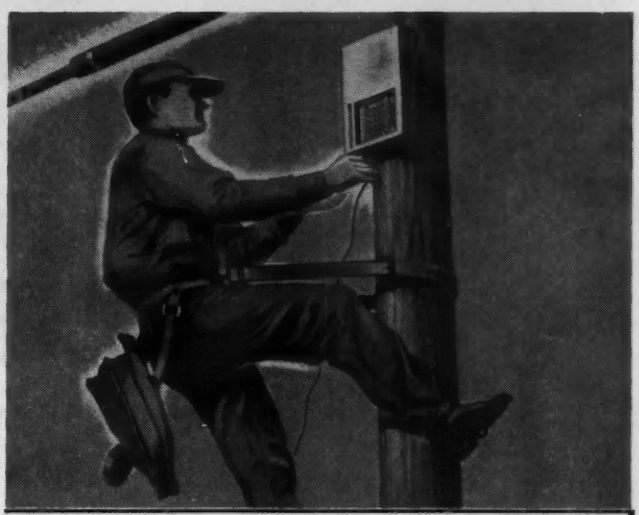

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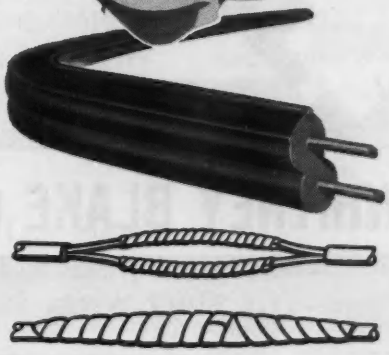
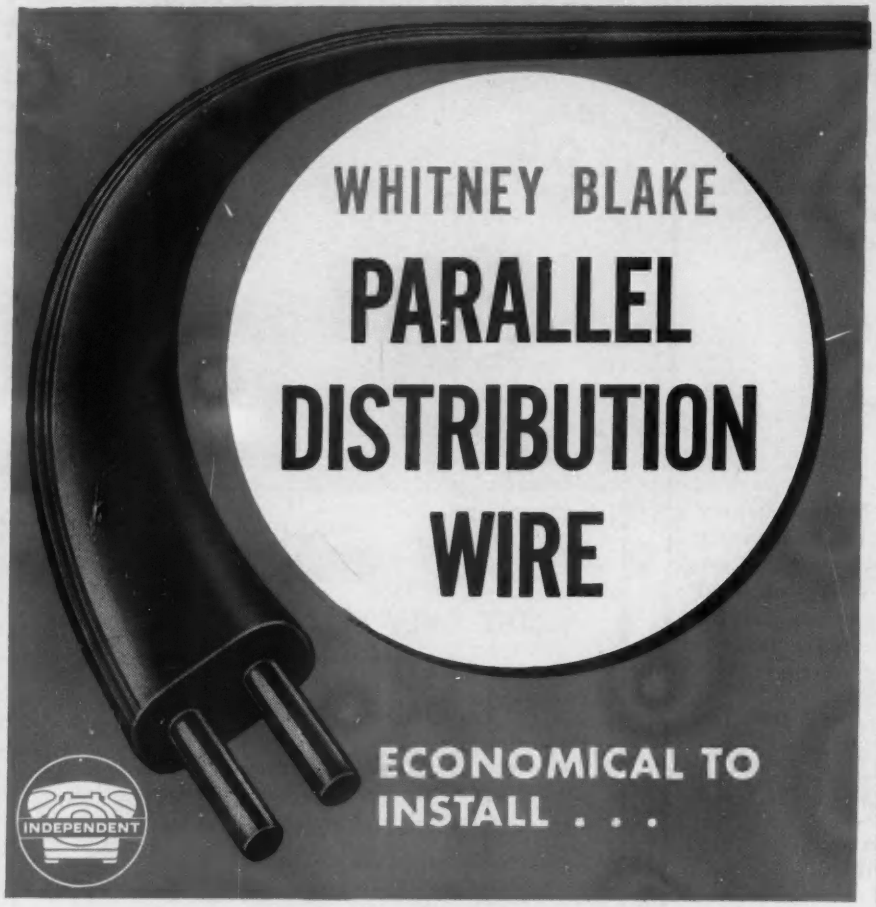


PARALLEL DROP WIRE SPLICE

- Wrap with a single half-lapped layer of BI-Seal Type 2A.
- Tension Tape approx. 3/4 original width. Extend tape 1/2" beyond sleeve
- Completed Splice
- Write for copies of Bi-Seal Splicing Methods, Specification BM-1



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WB

4-8

WHITNEY BLAKE COMPANY

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mercial engineer, will succeed Cole as general commercial manager of the company. Johnston was named senior traffic engineer in 1950, and has held the responsibility of general commercial engineer since December, 1951. He started his career in the telephone business in 1940 with the General Telephone Co. of Pennsylvania.

Richard C. Stearnes, former division commercial superintendent — central division, became general commercial engineer. Stearnes began his telephone career in 1945 with the Ohio Consolidated Telephone Co. He has served General of Ohio as commercial superintendent since November, 1956.

In the other organizational change, Howard E. Conely, district commercial manager — Marion district, has been appointed division commercial superintendent of the central division, succeeding Stearnes. Conely entered the telephone business in Marion in 1948 with General Telephone Co. of Ohio. He has been employed in his present position since May, 1958.

Management Conference Held By L. M. Berry & Co.

THE LARGEST Management Conference ever held by L. M. Berry & Co., was recently conducted in Dayton, Ohio, when 47 territory managers, division managers, division supervisors, general office personnel and general sales staff members laid plans to stimulate directory revenue and provide better service for the firm's more than 275 Independent and Bell telephone company customers.

John W. Berry, general sales manager, opened the annual meeting by introducing the new theme, "For Results To Count in '59, Get Them On The Bottom Line." He explained that this slogan was chosen to focus attention on the bottom lines of sales contracts and progress reports, where good results will show up prominently in the coming year.

W. L. Wolcott, personnel and training director, discussed the sales personnel picture and introduced and explained a Procurement and Employ-

Continued on page 90

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Second row (l. to r.): T. A. CALHOUN, Special Representative; S. H. RAINEY, General Training Mgr.; J. E. WHALEN, Wisconsin Division Administrative Mgr.; M. F. FEENEY, Louisiana Division Sales Mgr.; H. L. BOEBEL, Mississippi Division Mgr.; J. D. BRISTOW, Mid-Western Division Sup'r.; N. E. ROBINSON, Ohio Division Mgr.; E. W. BEANEY, New York Division Sup'r.; L. G. LAUGHLIN, Mid-Eastern Division Sales Sup'r.; J. D. BECKHAM, So. Personnel Mgr.; P. ENGLE, General Art Director.

Third row (l. to r.): R. E. SHEARER, General Sales Assistant; C. W. PEASLEY, Wisconsin Division Sales Mgr.-State; S. E. PHILLIPS, Mid-Western Territory Staff Assistant; R. J. BURKE, General Art Supervisor; W. R. CALHOON, Auditor; J. W. EGNOR, Sales Promotion Supervisor; C. A. SMITH, Tennessee Division Mgr.; H. C. EVANS, Mid-Western Division Mgr.; J. J. MULLIN, Personnel Methods Sup'r.; R. W. BRUNDIGE, Sales Promotion Mgr.; B. D. ADDINGTON, Mid-Eastern Division Mgr.

Fourth row (l. to r.): J. C. GRIMES, Ohio Division Sup'r.; J. L. BOWLING, Florida Division Sup'r.; R. A. MANER, Florida Division Mgr.; R. W. ALEFF, Wisconsin Division Sales Mgr. — Milwaukee; A. W. DERBINS, Shreveport Division Sales Mgr.; L. E. HURRELBRINK, Alabama Division Sup'r.; R. H. ESHELMAN, Louisiana Division Mgr.; W. C. WELCH, Kentucky Division Mgr.; R. T. DAVIS, Pennsylvania Division Mgr.; J. B. BOWEN, Alabama Division Mgr.; J. W. NAGEL, New York Division Mgr.; K. R. JEFFERS, Western Division Mgr.; E. F. TINNERMAN, Wisconsin Division Mgr.; W. C. FISH, General Sales Training Sup'r.; H. C. HULL, Statistician; J. M. BAYLEY, Eastern Sales Mgr.

ment Practice and Guide, which will be used by division managers as a reference in securing qualified sales personnel.

S. H. Rainey, general training manager, discussed initial sales training from the aspect of field coordination and follow-through. R. W. Brundige, sales promotion manager, discussed new, revised, and proposed sales aids, and introduced various classification filing systems under consideration for aiding sales personnel in planning accounts more effectively and efficiently.

The second day of the meeting was opened by Phil Engle, general art director, who discussed the use and results of specially prepared spec copy which is being supplied to sales personnel by the general art department.

J. W. Craig, Jr., general sales supervisor, presented a discussion on salesmen's planning. Emphasizing completeness and thoroughness, he made recommendations as to how the planning of accounts can be improved in 1959.

R. E. Shearer, general sales assistant, spoke on canvass and specialized account planning, and gave examples of how classification material can be used in creating effective sales aids.

Personnel and Training Director Wolcott began the third day of talks by introducing the selection procedure of trainees for management positions.

R. J. Burke, general art supervisor, pointed out significant sales factors brought to light in a continuing art production study. General Sales Supervisor Craig then presented "Supervision and Attitude in '58," in which he stressed management and supervisory responsibilities that must be met in the coming year.

Sales Promotion Manager Brundige, unveiled the company's sales incentive program for 1959. Highlighting this talk was the announcement of a new Supervisors' Contest, which will enable supervisors to compete for honors and prizes on the basis of canvass results. He also announced that several vacation trips are being offered this year in the sales contest, in addition to the usual merchandise prizes offered for outstanding sales achievement.

J. J. Mullin, personnel methods supervisor, opened the final day of the conclave by discussing "The Office Manager's Job" from the viewpoints of building the work team, administration, and production. He compared clerical performance of 1958 to 1957, and detailed office projects and objectives for 1959. General Training Manager Rainey followed with a talk on the problems involved in the evaluation of sales applicants, and made suggestions for improvement of evaluation teachniques.

Delivering the final address of the

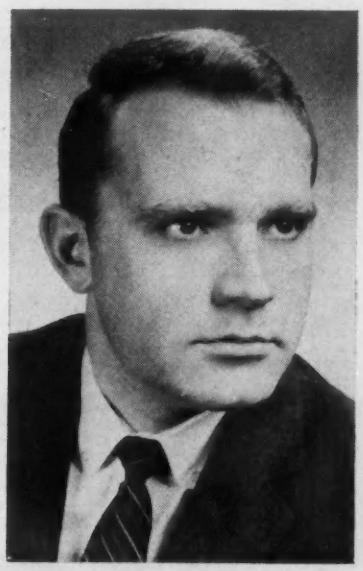
Concluded on page 94

JOHN W. GUILFOYLE has been elected executive vice president of Federal Electric Corp., service organization of International Tel. & Tel. Corp. In his new position, Guilfoyle will be responsible for the direction, coordination and administration of the company's operations, which include maintenance and operation of the Distant Early Warning (DEW) Line, the White Alice Alaskan communications system and other projects.

DEAN C. OMANS has been appointed field sales representative for the Whitney Blake Co., New Haven, Conn., wire and cable manufacturer. Omans succeeds J. L. Hodges in the territory which includes Minnesota, North and South Dakota, Western Wisconsin and Eastern Montana. Hodges has been transferred to Kansas City. Omans formerly sold Whitney Blake products when representing the North Electric Co., Galion, Ohio.

JAMES R. GLENN has recently been appointed to the position of assistant secretary of Superior Cable Corp., Hickory, N. C.

HOMER P. ROELLE, JR., has joined Superior Cable Corp. as a sales representative. His territory will include states of Ohio, Pennsylvania and western New York.



FRANK J. BABKA has been appointed Midwest Manager of Sequoia Wire & Cable Co., manufaturers of wire, custom cables and electronic equipment. Babka will headquarter at Sequoia's new Midwest offices in St. Louis, Mo. Babka brings to his new position, he will manage the ence inluding business associations with a New England instrumentation manufacturing concern and Southwestern Bell Telephone Co., and a tour of duty as Communications Officer in the U. S. Air Force.

ROY R. MARLOWE has been appointed manager of the newly re-alligned eastern regional office of Kellogg Switchboard and Supply Co. Marlowe will direct Kellogg sales activities in 10 eastern states from the new regional office and warehouse in Syracuse, N. Y. A Kellogg employe since 1953, Marlowe was field representative in New York State and later advanced to division sales manager. He was previously employed by Oberdorfer, Syracuse, N. Y., as contact engineer and assistant to the pres.

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MAGNETO TELEPHONES — Leich 901 wall or desk magneto telephones. Cleaned, tested and guaranteed, $16.50 each. As removed from service, $15.00 each, Turtle Lake Tel. Co., Turtle Lake, Wisc.

NORTH CX-200 — Excellent, complete, need instead two CX-60 or CX-100. Trade, buy or sell. Mogollon Mountains Tel. Co., 5 Crestway, Silver City, N. M. Phone 1071.

TOOL-GRIPS — Elastic Vinyl Plastic slip-on pliers etc. Insulates, cushions. Trial order for 1 pair Sm, 2 Med, 1 Lg. $1.00 Prepaid. Mail now to Modern Products Co., P. O. Box 2262, Gardner Station, St. Louis 9, Mo.

DIAL BOARD — Leich relay dial board — Just removed from service. Good condition — 200 lines, 170 equipped — Four digit dialing $5,000.00. Also Burroughs billing machine, excellent condition $400.00. Sunflower Telephone Company, Robert A. Ervin Jr., Mgr., Box 351, Dodge City, Kansas.

C.O. EQUIPMENT — One North Electric MCXR 200 lines dial equipment 2-5 numbering, chargers, ringing machine, 6 toll trunks, 20 links. Board used for 3 years in excellent condition. This is a complete CO minus batteries and main frame. For further information contact Frank R. Ritchie, Western Carolina Telephone & Telegraph Company, Matthews, N. C. VIctoria 7-1511.

STROMBERG CARLSON

KEY SENDER & TRUNK CKT. EQUIP.

(Excellent As Removed From Service)

Bay #1	Key Sender Ckt.	Print #B-45610 B-6088
Bay #2	For 12 pos.	DB-45600 B-6318
Bay #3	Trunk Ckt. Toll Train	B-45100 (36 Ckts.)
	Trunk Ckt.	B-42450 (10 Ckts)
	Trunk Ckt. Comb. Line & Rec.	B-40980 (30 ckts.)
	Trunk Ckt. Inter-Pos.	B-41080 (10 ckts.)
Bay #4	Toll Line Ckt.	B-40960 (24 ckts.)
	Toll Line Ckt. Comb. Dial & Ringdown	B-40940 (20 ckts.)
	Line Ckt. Toll Term.	#B-41040 (20 ckts.)
Bay #5	Toll Line Ckt. Comb. Dial & R.D.	B-40940 (20 ckts.)
	Trunk Ckt. Comb. Line & Rec.	B-40980 (40 ckts.)

BUCKEYE TELEPHONE & SUPPLY CO.

1250 Kinnear Rd. HU 8-0655 Columbus 21, Ohio

Carrier-Telegraph-RR Equipment (all new)

60 AP Selectors, new A-1	$35.00
162C Selector Set, new A-1	7.50
62B Selector Set, new A-1	40.00
61A Selector Keys, new A-1	15.00
60A Keys	2.00
560 Sounders, Main-line, 150 ohm	2.50
1-F Switchboards, Fahnstock	2.50
BD 100 Switchboards, North, with relays	99.00
(parts for BD 100) all new	
Polar Relays, W.E. 209 FC	7.50
Polar Relays, W.E. 209 FG	15.00
Polar Relays, W.E. 255	10.00

POWER SUPPLIES

RA 37 120VDC	35.00
RA 87 120VDC	50.00
RA 43 120VDC	100.00
130 VDC, 3 amp, W.E.	50.00
(2 in 23" cabinet rack)	150.00
48 Volt, 3 amp, WE, reg tube	75.00
48 Volt, 8 amp, WE, reg tube	100.00
48 Volt, 2 amp, Lorain, selin	90.00
24 Volt, 1 amp, Rectifilter	50.00
24 Volt, 3 amp, Rectifilter	100.00
24 Volt, 6 amp, Rectifilter	175.00
24 Volt, 3 amp, Recticharger	100.00
24 Volt, 3 amp, G.E. cpr-oxide	50.00
12 Volt, 1 amp, Selinium, fil	20.00

SUBCYCLES, Lorain

7.5 watt, Model M	35.00
15-20 watt, Model S	40.00
20 watt, Model B	50.00
VF Ringers, W.E. EE101A (2 channel)	100.00

Repeating Coils (new)

W.E. 70A ring-thru	$ 5.00
77A (substitute) C-161	3.50
76A (two coils) 1:1 rat.	5.00
75A (better matched)	6.00
91A (double coil)	10.00
93A, B, F, G	12.50
70A ring-thru	5.00
27A non-ring-thru	3.00
25A two of above	5.00
94E non-ring-thru	2.50
94G	3.50
94H	5.00
101A	5.00
120C, CS, E, ES	5.00
Retard coils, 149E D	3.00
(many other W.E. coils)	

CARRIER TERMINALS

TTH 1/TC (speech plus duplex)	$100.00
12 channel W.E. X61822A (per 3) (3 channels per cabinet) Teleg.	400.00
40A-1, Carrier Teleg. (write)	
42 B-1, Carrier Teleg. 6 channel	500.00
UH-8, Navy	50.00

Repeaters

CF-3A Carrier	100.00
TP-14 VF, portable	150.00

FILTERS—Carrier

Low-pass, high-pass, band-pass filters

RACKS, equipment

19" 7', self-supporting open, W.E.	35.00
23" 7', self-supporting, open, W.E.	37.50
19" 7', cabinet (2 door) W.E.	50.00
23" 7', cabinet (2 door) W.E.	60.00
(many others all sizes)	

TEST EQUIPMENT

160A Carrier Teleg. W.E. (used)	100.00
51A oscillator, W.E. (C carrier)	100.00
32A Trans. Meas. W.E. (C carrier)	150.00
12A Trans. Meas. W.E. VF	100.00
13A Trans. Meas. W.E. VF	150.00
5A Attenuator W.E.	37.50
62A Test Set, cable splicers, W.E. (also test cords & plugs)	7.50
EE8 Army Field Telephones, new	30.00
Reconditioned	20.00
EE 60 Wire Chiefs Test Set	25.00
Reconditioned	15.00
Ohm Meters, pocket, Weston-low ohm	15.00

TELEPHONES (completely reconditioned)

Western Electric #302 with F-1 handset, 5-H dial. Ringers: St. line, Synchromonic 16, 30, 42, 54, 66 cycle — Ready for service —immediate delivery $12.50

#302, as above, equipped with F-4 handset with T-1 transmitter — U-1 receiver (500 type) $15.00

#302, as above, but blanked for dial (F-1) $10.00

A.E. type 40, St. line, 16, 30, 42, 54, 66 cycle ringers, with #24 or later type dial (fully reconditioned) $12.50

(coiled handset cords, add 50 cents)

(thousands of other items in our stock)
shipped on approval — fully guaranteed

Telectric Co.

1218 VENICE BOULEVARD LOS ANGELES 6, CALIFORNIA

Richmond 8-2249

FOR SALE

TELEPHONE EQUIP. — 1 Channel 4B, 1 5B, and 1 6B Panhandle carriers complete. Also, 1 2 channel pole mount housing. Spare units, for carriers: 1 transmitter, 1 receiver, 1 SC signal, and 2 SS signal units, 1 high pass filter, 1 low pass filter, 19 F1 bridging filters. All at ½ original price. Also, 1 channel 5A Kellogg carrier complete with spare tubes at $300.00, used 3 years. Original cost $2,000.00. Potosi Telephone Co., 105 N. Mine St., Potosi, Mo.

1 — NORTH ELECTRIC, 300 line CX dial switchboard, equipped with 26 links, wired for 28 links, 8 automatic to manual CX toll trunks, 4 EAS dial to dial trunks, 5 semi-postpay paystation lines, decimonic ringing, intertoll dialing. MDF (Cook) batteries. Available immediately. This board convertable to a 200 line or 100 line separately if desired. For quick sale price of $800.00. Gray-Haddock Tel. Co., Inc., A. L. Lineberger, Mgr., Phone YU-3101, Gray, Ga.

SUBZERO TEMPERATURE GRADE — Ferrett Waterless Hand Cleaner. Tested for telephone company use. Usable right outdoors to 40 degrees below zero. Handy size for tool kits. Samples and information. Donner & Company, 135 Henry Ave., Winnipeg 2, Manitoba, Canada.

OLD WALL TELEPHONES — Desk stand telephones (candlesticks). Leich 901 and Leich C.B. phones. Highest market prices. Turtle Lake Telephone Co., Turtle Lake, Wisconsin.

DECALS
Made for trucks and equipment
Small or large quantities
Write for free catalog.
MATHEWS COMPANY
827 S. Harvey Oak Park, Ill.

NOTICE

Correspondence to all blind box numbers that appear without any address should be mailed to Box No._____ c/o TELEPHONE ENGINEER & MANAGEMENT, 7720 North Sheridan Road, Chicago 26, Illinois.

USE TELEPHONE ENGINEER AND MANAGEMENT'S CLEARING HOUSE

To locate workers—jobs—merchandise.

A small ad covers the field.

ADVERTISING, DIRECTORIES — *General Telephone Directory Co., 1800 Oakton Street, Des Plaines, Ill.*

BELTS — CLIMBERS — COMPLETE LINEMEN'S EQUIPMENT, *W. M. Bashlin Co., Bashlin Bldg., Grove City 1, Pa.*

BOOTHS — Acoustic Telephones — *Sherron Metallic Corp., 1202 Flushing Ave., Brooklyn 6, N. Y.*

BORING MACHINES, EARTH — *Highway Trailer Co., Edgerton, Wisc.*

CORDS, Switchboard (with or without plugs), Instrument (straight and retractable in eleven colors. — *Commercial Cord Co., Inc., 26 Main St., Clifton Springs, N. Y.*

CORDS, Switchboard & Telephone — *Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago 41, Ill.*

POLES, Creosote & Creosote Penta-Treated, Southern Yellow Pine — *Piedmont Wood Preserving Co., P.O. Box 700, Augusta, Georgia.*

POLES, Southern Yellow Pine — *Taylor Colquitt Company, 217 E. Main St., Spartanburgh, S. C.*

POLES, Southern Yellow Pine — *Texas Creosoting Co., Orange, Texas.*

PROTECTIVE EQUIPMENT — *Reliable Electric Company, 11333 Addison St., Franklin Park, Ill.*

TELEPHONE EQUIPMENT AND SUPPLIES — *Telephone Repair & Supply Company, 1760 Lunt Avenue, Chicago 26, Ill.*

WIRE, Insulated — DATED DROP WIRE — Neoprene or Weatherproof — *Alphaduct Wire & Cable Co., New Brunswick, N. J.*

WIRE, Insulated Drop and Bronze or Copperweld — *Acorn Insulated Wire Co., Inc., 36 Freeman St., Pawtucket, R. I.*

(Concluded from page 90)

Conference, General Sales Manager Berry detailed the role of management in the future development of the company, and placed emphasis on the areas of improvement in all phases of company operations which will be required to secure the objectives set forth for the coming year.

This meeting will be followed by conferences in each of L. M. Berry and Company's 13 Divisions, where the plans and objectives formulated in Dayton for 1959 will be presented to supervisory personnel.

Kenner Elected President Of Ansonia Wire & Cable

FREDERICK KENNER has been elected president of The Ansonia Wire & Cable Company, Ashton, R.I., succeeding J. S. Chafee.

A long time resident of Southern New England, Kenner is a graduate of The University of Rhode Island, Class of 1937, where he majored in chemistry.

During his business career, Kenner has been closely associated with the wire and cable industry. In 1937 he founded The R. I. Insulated Wire Co. and became its president. Following duty as a naval officer in World War II with the Office of Naval Inspection at Detroit, Mich. and Toledo, Ohio, Kenner returned to The Rhode Island Insulated Wire Co.

Hultberg Heads Kellogg's Electronic Products Div.

RICHARD M. HULTBERG has been appointed manager of the Electronic Products Division of Kellogg Switchboard & Supply Co., Chicago. He succeeds Ben E. Swanson, newly-appointed director of the new systems engineering organization.

Hultberg was employed by Kellogg in July, 1950, as a project engineer and subsequently served as supervisor of military electronic equipment, supervisor of the military projects section and manager of the electronic engineering department.

R. D. Spencer Joins Inland Testing Lab's.

ROBERT D. SPENCER has been named director of sales engineering

R. D. SPENCER

for the Inland Testing Laboratories Division of Cook Electric Co.

Previous to joining Inland Testing Laboratories, Spencer was associated with such firms as McDonnell Aircraft Corp., Vultee Aircraft, Curtiss-Wright Corp., General Tire & Rubber Co., and the Civil Aeronautics Administration.

Spencer is a member of the Institute of Aeronautical Sciences and is listed as inventor of a number of devices and systems including Spencer Angle of Attack System.

Exide Appoints T. E. Peacock New Marketing Manager

THOMAS E. Peacock, former manager of market research, has been appointed to the newly created position of marketing manager at Exide Industrial Division of The Electric Storage Battery Co.

He now is responsible to the general sales and marketing manager for advertising, sales promotion, market research, service engineering, and for supervision of the motive power, marine, electric utility and railway markets, and also has over-all responsibility for charging equipment sales in all markets.

Joining Exide in 1955, Peacock previously was with the Lavenson Bureau of Advertising, Inc. From 1947 to 1952, he headed his own market research firm in Los Angeles. Earlier, he was associated with Opinion Research Corporation, Princeton, N. J.

STROMBERG-CARLSON

Transmitter

A DIVISION OF GENERAL DYNAMICS CORPORATION

News and views of Independent telephone people VOLUME 7, NO. 11 • FEBRUARY 1959

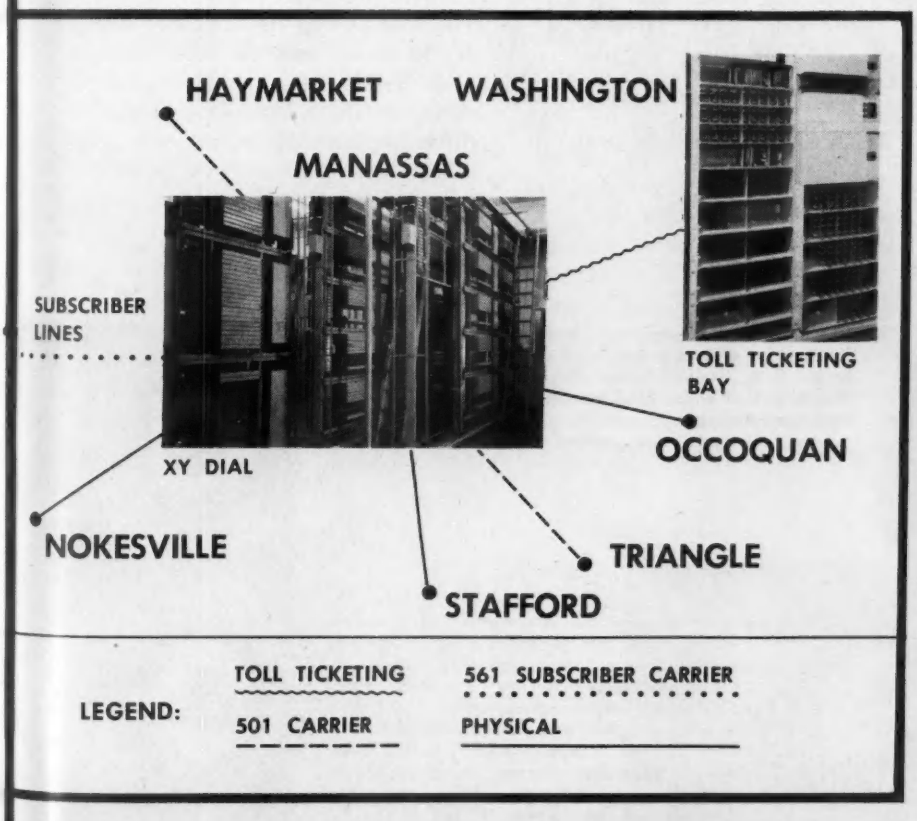
At Manassas, Virginia: a new communications center!

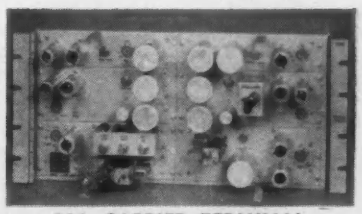
"We really enjoy using your telephones . . ." was one subscriber's comment at the recent introduction of XY Dial and Toll Ticketing at Manassas. A motel owner, her spontaneous comment came while a Stromberg-Carlson representative registered at the desk.

It's no wonder that her remark is typical of the acceptance and enthusiasm subscribers display in this new communications center. Manassas, nucleus of operations for the Central Mutual Telephone Company, has been molded into its important function through the practical planning of F. D. Vetter, general manager. His skillful application of Stromberg-Carlson equipment has brought maximum benefit to the company while providing quality service.

The 2050-line XY Dial exchange, including the Type 40 LID Toll Ticketing System, has placed more than 38 million telephones at his subscribers' fingertips.

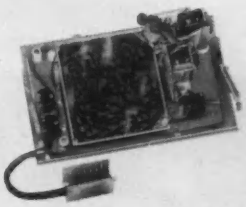
Five channels each of 501 Carrier and of 561 Subscriber Carrier have found their particular functions useful in providing the kind of service in the company's operating area that has prompted such favorable comments from subscribers.



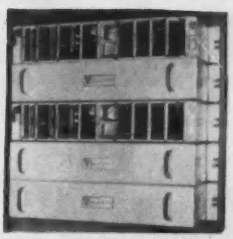


501 CARRIER TERMINAL

1543 TELEPHONE

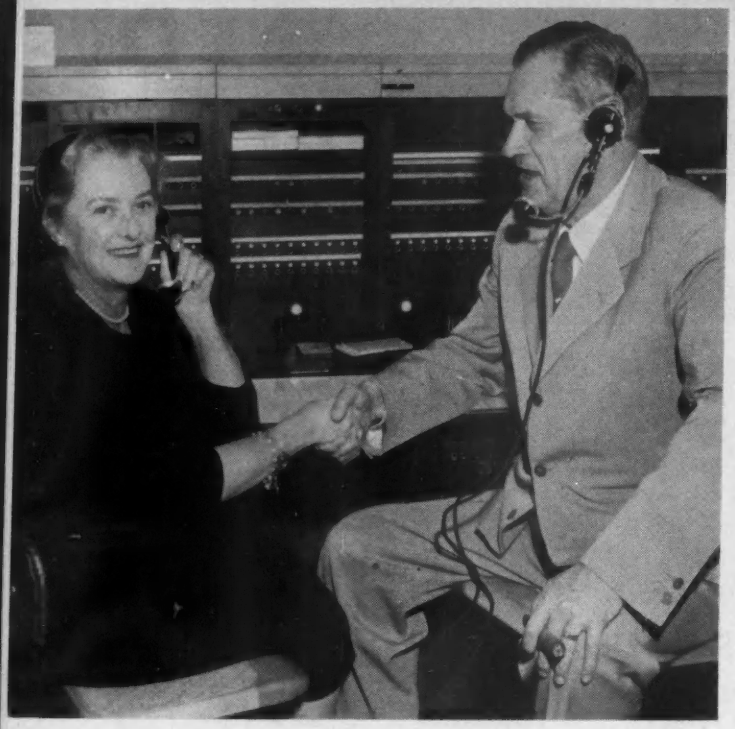


TAPE RECORDER



561 SUB CARRIER TERMINALS

Advertisement



It's alive! — Mr. and Mrs. Talbot Kendall shake hands on a successful switchover to the dial system in Manteca. Mrs. Kendall is president of the San Joaquin Telephone Co. Mr. Kendall is a broker with a finance concern in Stockton.

Modern building and modern services go hand in hand. New headquarters for the San Joaquin Telephone Company, Manteca, California.

President Dials 8...2

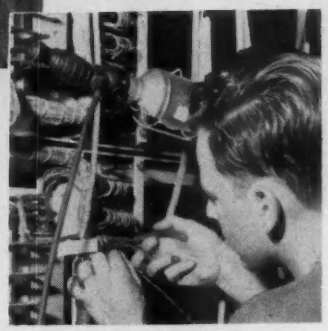
A new building, cutover to XY Dial, and — soon — Direct Distance Dialing certainly spell progress and up-to-the-minute service for subscribers of the San Joaquin Telephone Company. The modernization program was financed by the Stromberg-Carlson Credit Corporation, and was started in December, 1957, with the opening of new quarters and conversion to XY Dial.

This was only the beginning, for even before the XY Dial Equipment installation was completed, Mrs. Sallie Kendall, telephone company president, announced plans were already being made to bring DDD to Manteca, California. Toll Ticketing Equipment that will make Manteca a part of nationwide Direct Distance Dial system is now being installed, and cutover is planned for March 17, 1959.

An interesting sidelight to the dial conversion story is the selection of TAlbot as a dial office code prefix for one of the exchange areas. TAlbot happens to be the first name of Mr. Kendall, husband of Mrs. Sallie Kendall. The selection of a prefix name involves two principal qualifications. The first is that the first two letters of the name and the first number must represent a combination of digits on the telephone dial that is different from all other such com-

Bob Mallon, plant supervisor, explains the function of each powerboard panel to Mr. C. M. Hansen, former Mayor of Manteca, California; Mrs. Talbot Kendall, company pres.; and Mr. John Rosson, vice pres. and general mgr.

One more pose for this memorable occasion. Pictured from left to right are Bob Mallon, plant supervisor; Ken Johnson, Stromberg-Carlson sales supervisor; Dan Monahan, Stromberg-Carlson sales representative; John Rosson, vice president and general manager; Mrs. Talbot Kendall, company president; Mr. Talbot Kendall; Mrs. John Rosson, daughter of the Kendalls; Fred McGrady, Stromberg-Carlson sales engineer; and James McLean of the Pacific Telephone and Telegraph Company.



Behind every installation comes weeks of painstaking wiring, soldering and cable laying. Installation crew brings in cable at the grading panel (top photo) while wiring is being completed at the line finder panel (bottom photo).

binations in the region. The second qualification is that the name must be easily pronounced, for of course many telephone users in all regions still are served by operators to whom the word must be spoken. Several possible names beginning with TA were considered, but only one seemed to stand out. In selecting her choice, you could almost hear Mrs. Kendall say, " 'Talbot' is easy to say. After all, it's been part of my vocabulary for many years . . . I might even call him '8 . . . 2' once in a while."

Where can I find corn for popping?

Supermarkets are surely becoming one-stop shopping centers. Many of these mammoth stores are handling — along with normal food staples — records, toys, hardware, toiletries, even clothing. Convenient, yes — but woe to the shopper who is looking for her favorite delicacy hidden somewhere in the canned goods department . . . or is it the dessert counter?

One of the more successful methods to help the befuddled shopper is a telephone information system. Attractive colored phones are distributed throughout the store and directly connected to a "courtesy counter." The shopper picks up the phone and asks where her favorite product is located.

A simple but very effective idea: better service for the store; additional revenue for the telephone company. And there's an additional benefit. Once you place these phones inside a store where they will be seen by thousands of persons, you derive a promotion bonus for the sale of home extensions. Why not consider "courtesy telephones" for your shopping centers?

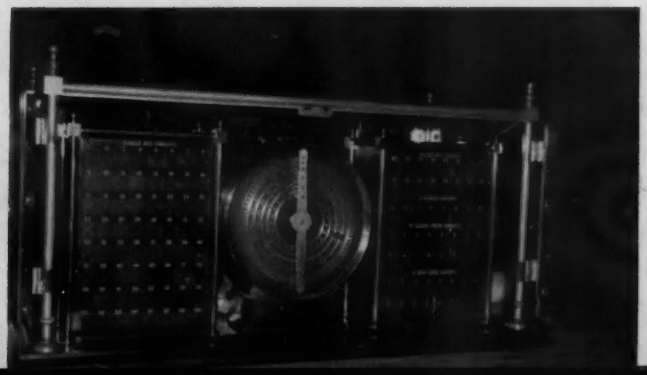
Old reliable... still performing its vital function

What might very well be the granddaddy of all line routiners is the Firebox Line Test Unit used in the Buffalo Fire Department, Buffalo, New York. It has been functioning perfectly for nearly 40 years and still performs the vital task for which it was installed.

The clocklike arms of the center dial sweep across the copper contacts on the dial, automatically testing each firebox line. A faulty firebox line will be visibly indicated on the associated test panel block.

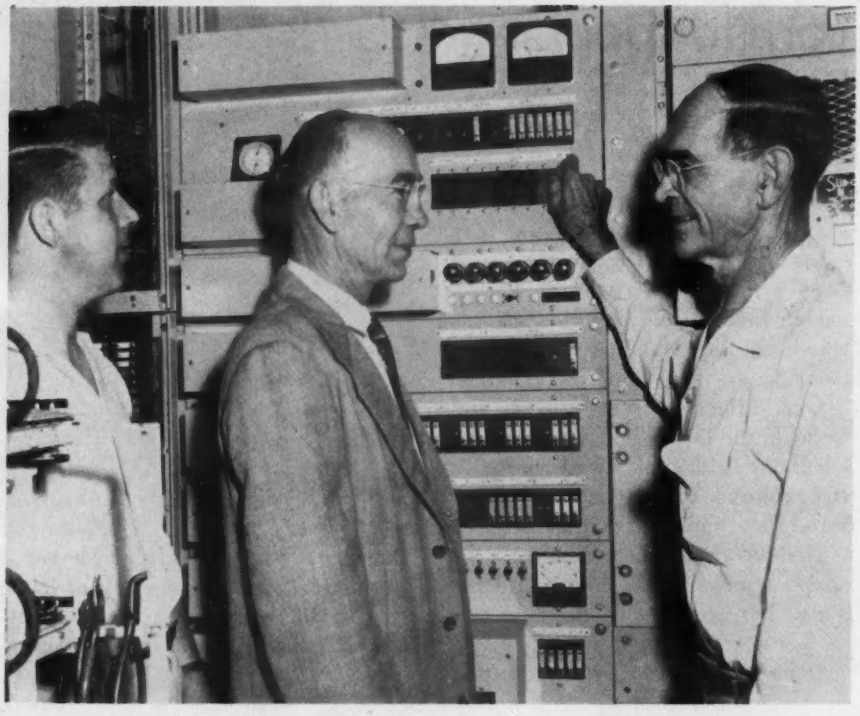
When originally installed, the motivating force for arm motion was supplied by a mechanism very similar to the type used by weight-wound grandfather clocks. The unit was subsequently "modernized" by the installation of a time-controlled motor which will cause the arms to periodically sweep across the test dial.

Even though population growth has increased the complexities of communication systems, the search for simple and complete test equipment goes on. The Stromberg-Carlson Portable Test Routiner described in the November, 1957, "Transmitter" is a giant step towards simplifying the line routining problems for any size exchange operation.



Advertisement

REA loan brings dial to Laurel Point, W. Va.



Mr. D. C. Dodrill, right, manager at Laurel Point, makes cutover official in the presence of A. J. Leonard, left, Stromberg-Carlson installation foreman, and Mr. Cecil Dodrill, president of West Side. *(Morgantown Post photo.)*

Stromberg-Carlson dial equipment is now serving more than 400 subscribers at Laurel Point, W. Va., thanks to an REA loan made to the West Side Telephone Company.

The loan made possible the construction of a concrete-block exchange building and the purchase of the 160-line dial system for this community near Morgantown, home of the University of West Virginia.

Mr. D. C. Dodrill, vice president of the West Side Telephone Company, officially started dial service in Laurel Point and "retired from service" the old manual board in the Dodrill home.

Applications for service received from 18 additional families in the area were being processed at the time of the cutover. This was another indication of the eagerness of Laurel Point subscribers for dial service.

Can you guess the hunter's name?

If it were not for the license, the young hunter pictured here could have easily become "ageless."

Texans, especially, should recognize this man. The picture was taken while he was on a successful hunting trip with the late "Doc" Fairly, near Junction, Texas.

The "unknown" hunter enjoys relating another incident that happened with Chet Ruth, formerly with Cook Electric, and Sam Teas, former owner of the Floresville Telephone Company and a director of the Texas Telephone Association.

It was a warm day when our hunter arrived at Floresville, and after lunch the men took to the fields dressed accordingly. Two hours passed. Sam Teas had his limit of 15 birds; the man in the photo had 14. A blue norther came in; the temperature dropped to about 40 degrees — the wind blowing a gale. Our hunter, with his sales background, hated to leave without that other order, which would be the fifteenth bird.

On the way back to the car a single quail took off from the brush. (As you might have guessed, the man in the picture is Tommy Thompson, Stromberg-Carlson's Telecommunication General Sales Manager). To continue the story: Tommy whirled around, got the bird "on the dotted line," causing Sam Teas to mention that Tommy "never missed a shot."

Mayor C. L. Marcantel (right) received the "go ahead" to begin the cutover, from J. M. Nelson, division manager for Southwestern States (left). Others on hand are Sidney Adams, president of a businessmen's club, and Dr. Fred Macceau, vice president.

Southwestern Telephone Company's Louisiana exchanges now all dial!

First dial call was made by Sidney Adams. Witnessing the occasion were Mayor Marcantel, Mrs. Aline Thompson and Mrs. Ella Chapman, C. O. agent.

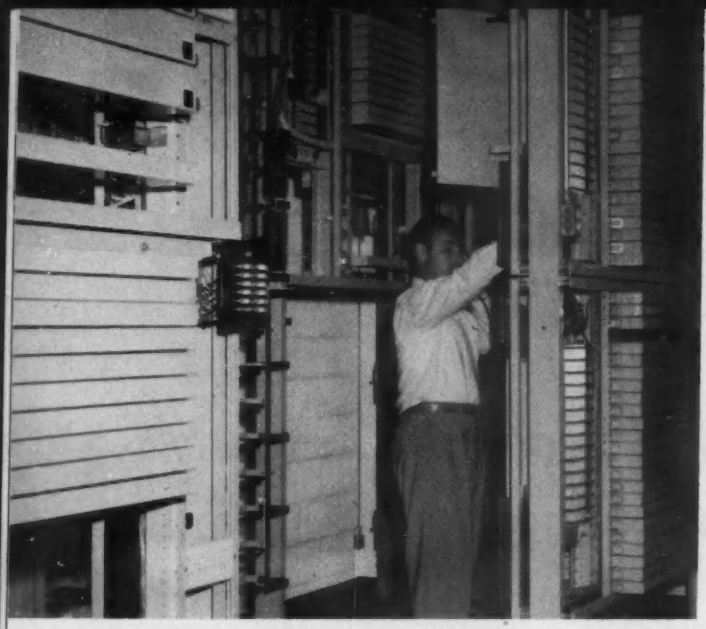
The twenty-third and last Louisiana exchange of the Southwestern States Telephone Company — Elton — has been converted to XY® dial.

On December 22nd, this 700-terminal exchange joined other Southwestern offices located in nearby Church Point, Sunset, Iowa, Welsh, and Mamou — just to name a few — with changeover to this type of dial system.

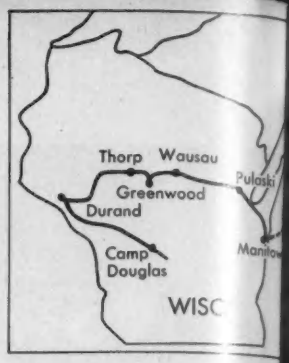
Cutovers to XY dial operation are not new for Southwestern States — but there must have been some uphill climbing in preparing this group of exchanges. Located in the southwestern part of Louisiana, the exchanges lie athwart that area which is susceptible to an annual parade of hurricanes. 1957 saw a particularly devastating blow, but the company was determined to carry forward its new construction program even as they poured men and money into the breach caused by that reckless "Audrey."

Many local civic leaders as well as officials of the Southwestern States Telephone Company were present at this climactic cutover. Progressive planning and just plain hard work for everyone including H. N. Hammond, Chief Engineer; D. B. Strickland, Vice President and General Manager; and J. M. Nelson, divisional manager — just to name a few — were certainly apparent when the doors to the new telephone building were opened and the quiet new equipment became an active mechanical medium for local telephone service.

Last calls are now going through. Taking the requests are Mrs. Dorothy Johnson and Miss Effie Leger; operators looking on are Mrs. Winnie Parish and Mrs. Beatrice Kersh.



Postman's Holday No. 5



One of the most thankful men in all Wisconsin is Joseph M. Keating of Thorp, Wisconsin. A devastating cyclone last Spring hit all around them . . . miraculously spared his entire new plant.

Hurried as the Spring cyclone

Bisecting "Dairyland"

Back in *New Lisbon,* Wisconsin, this chapter began with a pleasant variation to the routine, the manager being a very charming as well as capable young lady. Commuting as necessary from nearby *Camp Douglas* headquarters, Edith Johnson leaves exchange operation to XY School-trained Carl Olsson, has her own work cut out in planning for the future. Camp Douglas, for instance: onetime logging camp, then military training post starting with the Spanish-American War, and under different names (Williams and Volk) preparing men for the unknown future. And that's her problem here — what is the size and strength of this future?

Journeying westward (alone for a spell), your reporter had a most interesting afternoon with a man who also had the telephone business thrust upon him. Byron Dale chose teaching as a career — had several years of this in public schools before becoming an instructor for the Air Force at Chanute Field and Yale University. But business leaders and farmer groups wanting better telephone service reorganized the small companies serving the area, set about to obtain R. E. A. financing, and persuaded Mr. Dale to become manager.

Relatively speaking, *Durand* is less exciting today than in those golden days when the Chippewa Valley was the sawmill center of the country. Loggers' rafts would tie up at Durand while hundreds of "Paul Bunyans" invaded the hotel, free-spending the aches and chills out of drenched bodies. Curfews for respectable citizens were strictly observed, but for those whose interests were furthered by these sporadic invasions, the town had a liveliness it has long since forgotten.

With Durand and Nelson now converted to XY Dial, work has started on nearby Arkansaw. Here, as at Durand, the dial program is starting in the rural areas where it was needed most, and working back toward the center.

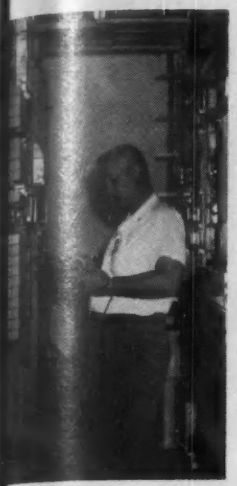
Having reached the turn-around point, the route led back eastward, with a few moments to sandwich in a visit with Stanley Lockwood and Harley Hesselman at *Mondovi.* The Graflex (Camera) Corporation has had no satisfactory answer as to why all photos failed — but neither Stanley nor Harley has aged one whit since our call three years ago, still enjoy trouble-free operation and normal growth.

It was between Mondovi and *Thorp* that cyclone evidence was most noticeable. While most of the Thorp properties escaped damage, manager Joe Keating and his plantman, Marion Herman, showed a small section of 7-strand messenger whipped like a pony tail in a breeze.

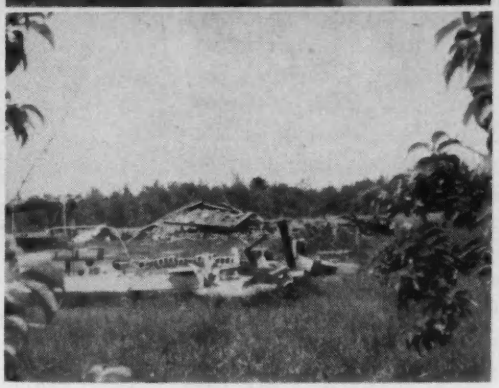
Thorp has a beautiful exchange — big, clean, efficient. Joe Keating's experience goes back to college days when he worked the switchboard nights; now he sees only smooth sailing ahead; he is perfectly at home within the equipment room or out on the lines. And like Telephone men elsewhere, he enjoys helping a neighbor, such as Mrs. Cepha Knutsen of *Greenwood.*

Her father had started the company

Serving Wisconsin's principal industry, the Walker Stainless Equipment Co. chose New Lisbon for its central location, is one of larger customers of Lemonweir Valley Telephone Company . . . Byron Dale, manager at Durand, Wisconsin, left security of teaching for uncertainty of a complete rebuilding program in several Chippewa Valley towns . . . Dominating the town as well as the lives of Pulaski citizens is the Assumption BVM Cathedral. Original settlers were from Poland; unique customs still maintained by present generation.



Jack Bullis, R.E.A. field engineer out of Stevens Point, makes some acceptance tests at Greenwood prior to cutover.



Two sides of the same road near Thorp: man-made reservoir offers "natural" beauty, recreation, peace; across the highway, ruins of a farm — not one stone or timber could withstand awesome force of twister.

Mr. and Mrs. Robert Riordan of Pulaski show a visitor their first XY Dial exchange at Mill Center. Efficient steel building is advantageous in this rural location.

in 1905; her husband took over in 1947 after discharge from the Army and worked (probably too hard) to rebuild for a solid future. Not too long ago, preliminary rehabilitation completed, he signed the contract for dial equipment — died the next day. Mrs. Knutsen, helped by many, including the Carl Crane Engineering Company, has carried on superbly; the fine dial exchange Mr. Knutsen planned is now an accomplished fact.

The reporting team, reunited at Wausau, were charmed by the friendly welcome at *Pulaski*, where Mr. and Mrs. Robert Riordan have found a real challenge, as well as a place they are proud to call home. In the midst of Old World traditions still maintained from a predominantly Polish ancestry, these people want — and are getting — modern telephone service. At the halfway post, the Riordans are getting new wind for the final push. In a later issue this chapter will be written.

Thorp exchange was easily spotted as one of the newest and best-looking buildings in town.

"Service is splendid now," stated Sister Christopher, administrator of St. Benedict Community Hospital in Durand.

Thorp Finance Company is a principal employer in this city — occupies this older downtown location and beautiful new headquarters on outskirts.

Personal thanks to Dave and Emily Bierbrauer, friends from "way back" who welcomed travelers to their comfortable home in Wausau.

Helen Lasek trains a new operator, Beverly Weyenberg, at soon-to-be-retired magneto switchboard in Pulaski . . . After long hours rebuilding lines for coming XY Dial service, this trio of Pulaski linemen call it a day . . . Overnight ferry to Michigan saved 150 miles of driving, was pleasant variation of motel theme. One unnecessary word: don't try to sleep until all the freight cars are loaded!

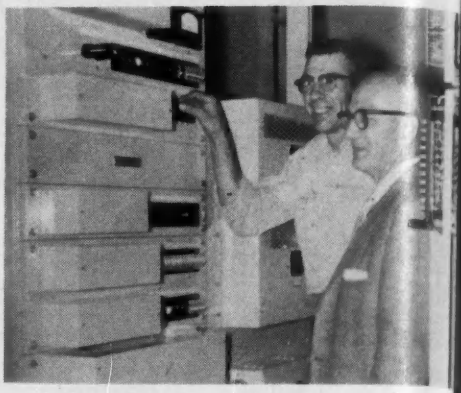
Mullinville, Kansas, subscribers are now enjoying dial service

Howard Kendall (photo on left) is in a relaxed mood after having completed the successful cutover. Like his daughter, pictured here, Mr. Kendall's family always helps him in his work.

Anyone who has met Howard Kendall will tell you its hard to find a more congenial man.

In addition to having a friendly nature, Mr. Kendall, as owner-manager of the Telephone Service Company, has brought XY Dial service to Mullinville, Kansas. Located in the center of the wheat farming area, Mullinville is about 35 miles southeast of Dodge City. Besides farming, Mullinville has a gas and oil pumping station.

A loan from the Stromberg-Carlson Credit Corporation made possible the conversion to dial of this 140-line C.D.O. and construction of the central office building. Now, thanks to Howard Kendall and his wife, more than 250 subscribers in and around Mullinville are enjoying XY Dial service.



Lending a hand during the conversion are Frank Micka, Stromberg-Carlson sales representative (shown above with Mr. Kendall) and J. P. Heavner, Stromberg-Carlson installer (in lower photo).

Telephones and Brotherhood

Every day telephone people practice and help encourage some phase of brotherhood.

Much has been written about brotherhood as a sentiment or as a duty to fill another's need. But brotherhood has another dimension which refuses to be ignored in these days of danger to free civilization. This is the dimension of mutual respect and appreciation. It demands to be expressed in willingness to receive from our brothers of other nationalities, races or backgrounds the valuable ideas they have acquired in their experience. As we receive, we should also be willing to offer them our experience.

The excuses for ignorance about one another are disappearing with the increase in communications among all mankind. The dangers of ignorance also increase because communication based on misconceptions tends to breed enmity where trust and sympathy are needed.

The United States is considered the melting pot of the world. It is here particularly where those of us in Telephony have in communications the binding media for making our communities more neighborly and bringing people closer together. Through this art we can help them learn more about us and more about themselves . . . We can do this in the same high tradition of helping our own telephone neighbors in time of need.

Just as communications is Telephony's common denominator, so can we make communications — of the highest order — the blood line to all our brothers.

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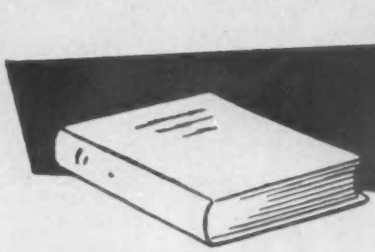


THE BACK OF THE BOOK

By JOHN G. REYNOLDS

Out of the Past

SIXTY-YEAR-OLD card bearing unique instructions on telephone usage has been received by Company Historian G. L. Long of Bell Tel. Co. of Canada.

Titled "What This Phone Is For," the card gives information such as, "Do not argue with the operator . . . DO NOT SHOUT . . . Clerks must not quarrel or argue with customers . . . Face the transmitter . . . Do not turn your head to one side and expect clear conversation . . ."

The card was turned over to T. A. Baker, District Sales Supervisor, London, Ont., by A. J. Morgan, 90-year-old retired businessman, who found it while organizing material for his memoirs.

Mr. Morgan said the card, placed on the wall alongside the telephone, was so successful that he printed additional copies for other possessors of the "new medium."

Lead-off information was: "We pay rent for THIS PHONE and it is for the exclusive use of work in connection with THIS BUSINESS and for receiving orders from our customers. It must not be used otherwise by anyone except in cases of emergency."

For Heavy Sleepers

FOR THOSE who find it a bit difficult to settle down into the groove of what is rapidly becoming another routine year "*Quote*" magazine brings word of a new alarm clock for stubborn sleepers.

Lately patented by a watchmaker in Naples, this alarm is unique. If the sleeping sluggard does not arouse himself and switch off the normal alarm, an electrical device incorporated in the clock starts a taped broadcast featuring the continuous honking of a car horn, the prolonged barking of a dog, several pistol shots, and finally a cannon's booming report. If all this fails to arouse, call the coroner.

"Job Security??"

THIS NARRATIVE, sent to us by a reader, concerns a certain large corporation (*not a telephone company*) which, some months ago, severed from its pay roll a sizeable number of employes, due to the sluggish state of trade.

With an improvement in the economic picture, the corporation's personnel department has lately been making overtures to these former employes, looking forward to a resumption of business relations.

Last month, after concluding a number of interviews, it became the painful duty of a personnel clerk to approach his senior officer with a report:

"I'm not getting anywhere trying to re-hire those men," he said. "They all have other jobs now, and most of them are making more money than we paid them."

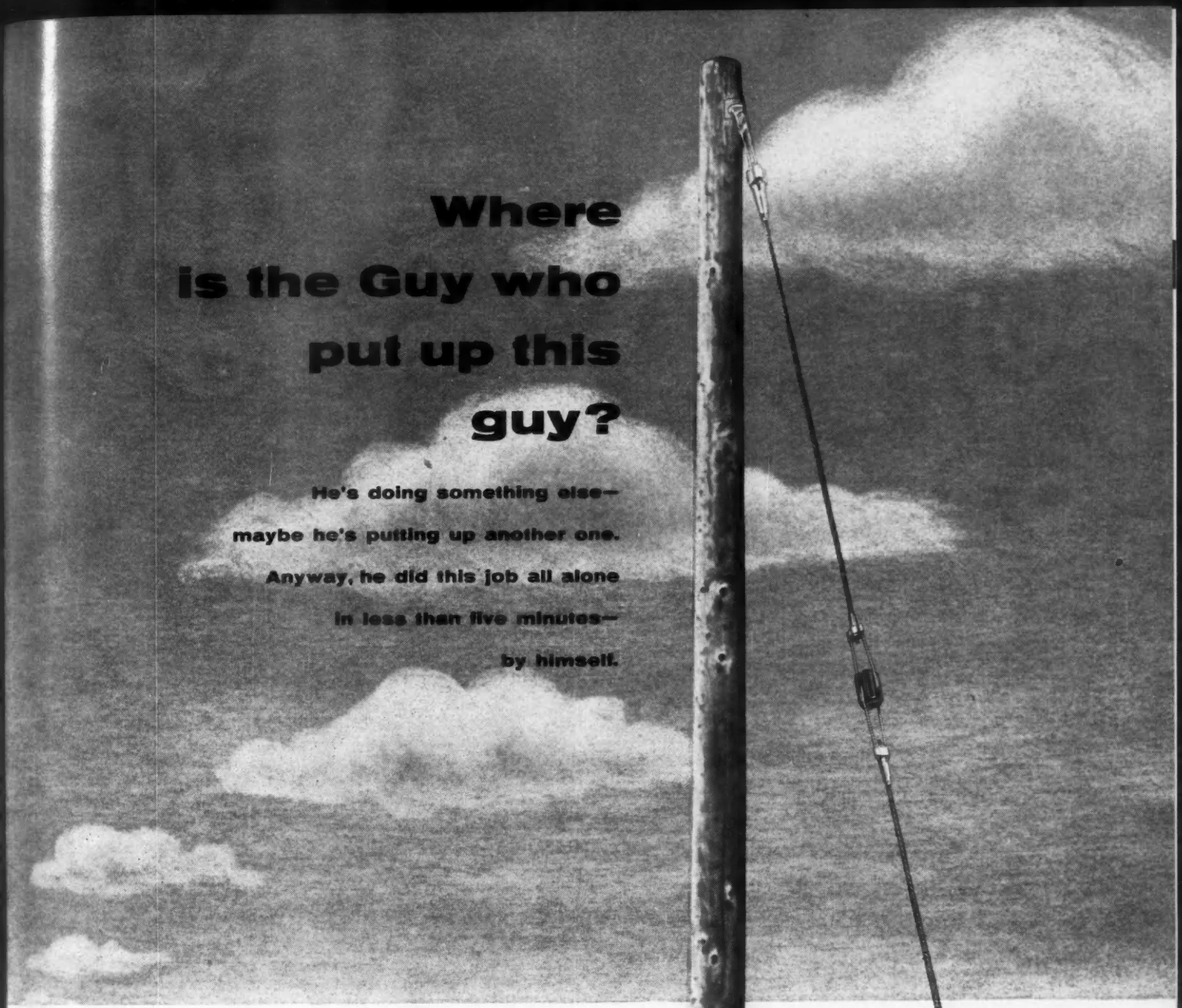
The chief meditated these tidings for a time and then made a profound observation. "Well," he said judicially, "they may be making more money, but they can't match the job security they had here!"

"Back Talk"

WE WERE not amongst those Orwellian disciples who shuddered at the implications of *Animal Farm*. The prospect of man's eventual subjugation by beasts of the barnyard leaves us pretty cold. Our apprehension centers upon a much more realistic prospect; the ultimate surrender of our species to the demoniac fabrications of our mechanistic genii.

This inherent skittishness is further fueled by a report of one of our scouts who visited the Portuguese Industrial Fair, at Lisbon. There, he relates, in a display of gambling devices, he came upon a slot machine which giggled triumphantly when it beat the player and growled in discontent when, on rare occasion, the player made a gain.

"No, No, Charlie! I said 'Bring me that winch *LINE!*'"



Where is the Guy who put up this guy?

He's doing something else—
maybe he's putting up another one.
Anyway, he did this job all alone
in less than five minutes—
by himself.

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